

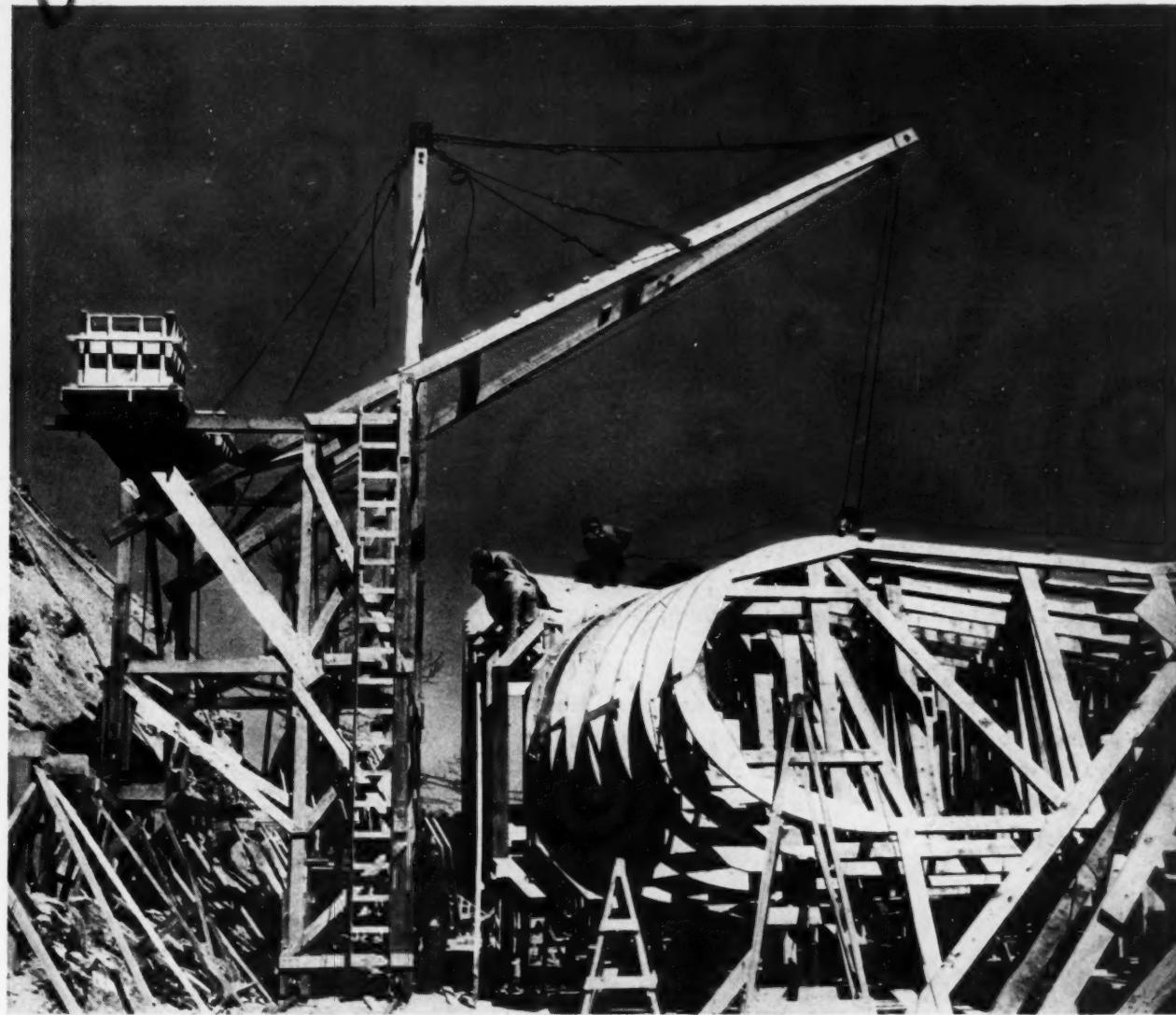
TECHNOLOGY DEPARTMENT

# Construction Methods

MAY 1947

A M C G R A W - H I L L P U B L I C A T I O N

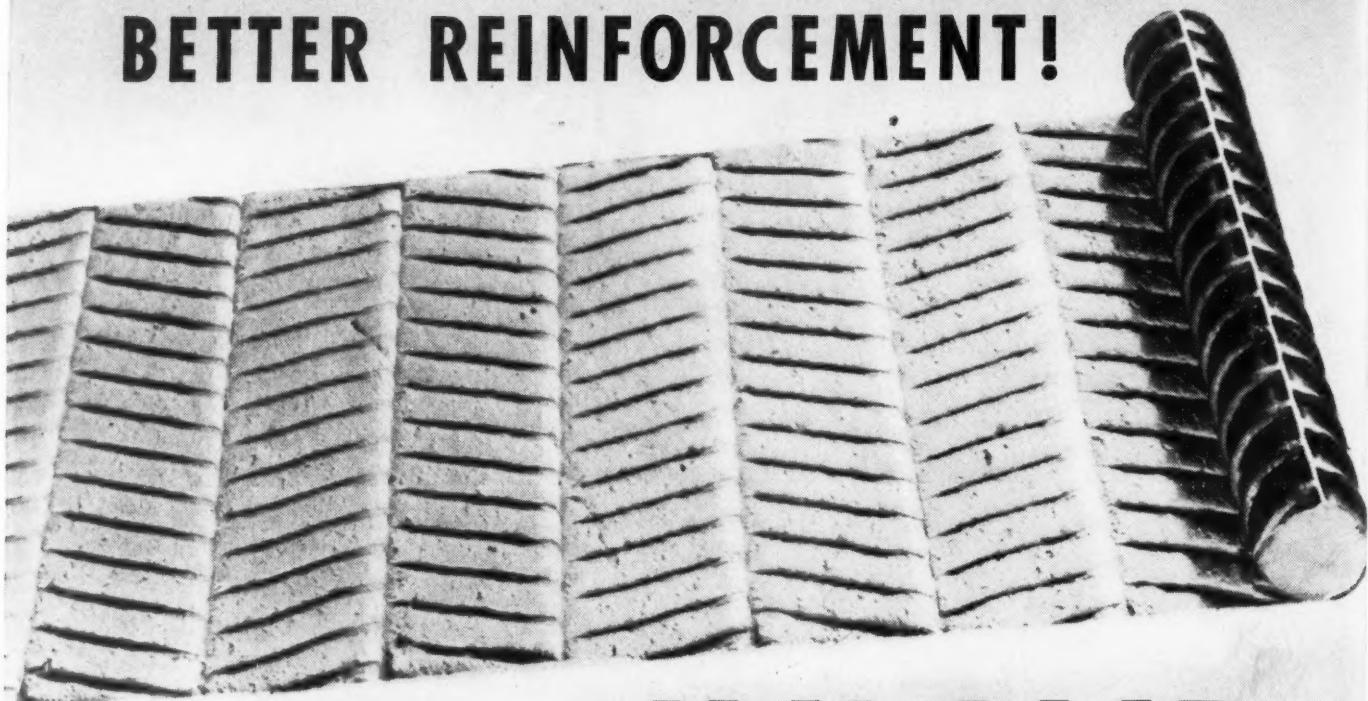
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DETROIT B



Traveling A-frame derrick handles draft tube forms at Allatoona Dam

Preliminary Work at Allatoona Dam • Acre-a-day Paving at Panama Airport • Steel Frame Houses for Baltimore • Special Equipment Widens Florida Road • Concrete Pumped for Norfolk Pier Project Tunnel Driving on P. R.R. Relocation

# GREATER MECHANICAL GRIP! BETTER REINFORCEMENT!



## WITH INLAND **HI-BOND RE-BARS**

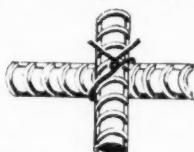
The above impression shown in wet cement clearly illustrates the greater mechanical grip made possible by the reversed double helical ribs of the Inland Hi-Bond bar.

This Inland developed design permits greater use of steel's potential strength in concrete construction. It also improves transfer of stresses, crack control and resistance to slip . . . advantages that will make possible higher design stresses and thereby lower construction costs.

Write for a copy of the bulletin on Inland Hi-Bond bars.



Helical ribs dovetail for high tensile strength and shorter overlap at splices.



Hi-Bond ribs key into each other, hold firmly, stay anchored, when crossed and wired.

**INLAND STEEL CO.**

38 S. Dearborn St., Chicago 3, Ill. • Sales Offices: Detroit • Indianapolis  
Kansas City • Milwaukee • New York • St. Louis • St. Paul

**INLAND  
STEEL**

OTHER PRODUCTS INCLUDE: BARS, STRUCTURALS, PLATES, SHEETS, STRIP, TIN PLATE, PILING, FLOOR PLATE, RAILS, TRACK ACCESSORIES

A. E. PAXTON, Publisher

# Construction Methods

WALDO G. BOWMAN, Editor

THE CONSTRUCTION MAGAZINE WITH PICTURE POWER

Established 1919

HAROLD W. RICHARDSON, Executive Editor

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MAY 1947 Volume 29 • Number 5

## CUTS AND FILLS

EVIDENCE ON ALL SIDES points to a slowing down in construction—materials shipments, employment and contract awards are all falling off. There is only one reason, prices are too high, at least construction buyers think they are, which amounts to the same thing. Buyers are simply on strike. There are many factors contributing to current high costs: Some materials prices are way out of line; government building restrictions influence costs in some cases; and hourly wage rates are abnormally high. But labor costs are also affected by union restrictions, so-called feather bedding and pathetic worker efficiency and output. A building research committee of the A.G.C. of Minnesota tersely sums up the situation in a report: The need "is a concerted move by owners, contractors, subcontractors, material and supply dealers, and labor to bring costs within a reasonable investment basis. There is no justification for present building costs . . . Owners must cooperate by not requiring contractors to engage in extravagant practices. Labor must give more of value in exchange for its high wages, or the work will simply close."

AS ONE MEANS of reducing construction costs Dwight W. Winkelman, vice-president of the A.G.C., advised the N. Y. State Highway Engineers Association to avoid the temptation to specify both results and methods. When the engineer specifies both, he must assume responsibility for the result and may prevent the contractors from devising and using a more efficient and economical method than the one specified.

AMERICAN CONTRACTORS can undertake construction work in the Philippines under the Rehabilitation Act of 1946 on an equal footing with Filipino contractors, according to Thomas H. MacDonald, PRA Commissioner. For such work, American contractors will have equal status with Filipino contractors in qualification for bidding, determination of the low bidder, and award of contract.

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The 1948 Road Show will be a combination inside and outside exhibit at Soldier Field, Chicago, Ill., July 16-24. Lack of adequate inside space at Chicago Dodge plant where show was tentatively scheduled for February 1948, led American Road Builders Association to shift to a summer outdoor display for the first time. Available space totals more than a million sq. ft. and the show will be open nine days.

McGRAW-HILL PUBLISHING COMPANY, INC. • 330 WEST 42nd STREET, NEW YORK 18, N. Y.

JAMES H. McGRAW, Founder and Honorary Chairman

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**TORQUE CONVERTER  
TRACTORS**

**WHAT THE MEN WHO**



# HOW OWN THEM SAY...

## MIDWEST OWNERS

Tried, tested, proved! First Torque Converter Tractor led to purchase of seven additional units. More on order.

S. A. HEALY CO., Chicago, Illinois

"Have 12,000 hours on our Torque Converter Tractor and it is still in good condition. Has moved many thousands of yards of dirt with minimum repair cost."

DE RUYTER BROTHERS, Willmar, Minn.

"Less shifting feature is appreciated by operator. Steering clutches last longer. Tractor requires less servicing because shock is absorbed."

JOHN DEHNER, Fort Wayne, Indiana

"Ability to constantly increase motor power without 'clutching' cannot help but reduce to no small extent, the wear and tear on transmission and drive."

SCHUERMANN BUILDING & REALTY CO.,  
St. Louis, Mo.

## SOUTHWEST OWNERS

"Torque Converter Tractor is finest bulldozer tractor ever built. We also use a Torque Converter Tractor with a scraper and haul more dirt faster and cheaper because of time saved shifting gears. Low upkeep on tractors and auxiliary equipment."

OLENE HANSON, Houston, Texas

"Never had a tractor which moves dirt as quickly and cheaply as a Torque Converter. Got 3,000 hours on my first one and no trouble yet. Now own three."

STORMS CONSTRUCTION CO.,  
Pampa, Texas

## NORTHWEST OWNER

"Get one-third more production and smoother performance than with conventional tractor. Less operator fatigue."

WIRKHALA BROS., Naselle, Wash.

## WESTERN OWNERS

"Not interested in any tractor that does not have Torque Converter."

JOHN IBEN, Phoenix, Arizona

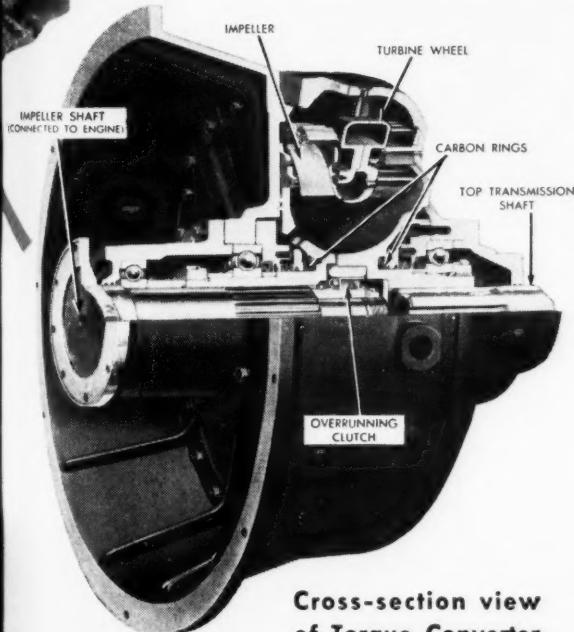
"Easier and smoother operation. Less breakage of either pulled or pushed machinery or cable. Use two units—pull scrapers, land planes and rippers, clearing and leveling desert land."

HANSON FARMS, Casa Grande, Arizona

## EASTERN OWNER

"Moves 20 percent more yardage, yet upkeep cost is about half that of conventional tractors."

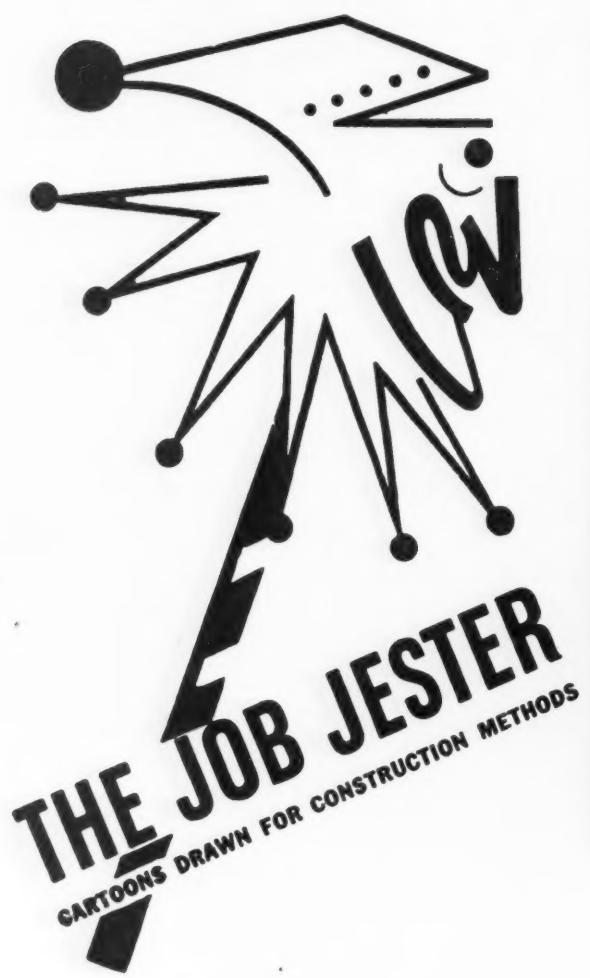
MILLS, GORMAN AND McALLISTER,  
Wendell, West Virginia



Cross-section view  
of Torque Converter

Like these users, you can lower cost, step up yardage moved with Allis-Chalmers Torque Converter Tractors. Here is "get up and go" performance with less gear-shifting. Operation is continuously smooth — starting, pushing, pulling. This all adds up to more work done, less maintenance, MORE PROFIT! Now is the time to investigate.

**ALLIS-CHALMERS**  
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.



"Here they come with the pipe now."



"I don't worry about him missing and hitting me.  
I put his gold watch on my head!"



"No two ways about it, Judson, this is a machine  
age we're living in."



## BRIDGE IT WITH 'INCOR'

### 'INCOR' SPEEDS OPENING OF 2 NEW LANES ON BRONX-WHITESTONE BRIDGE



Widening roadway of Bronx-Whitestone Bridge, New York City... 'Incor' concrete placed one day, ready for heavy traffic the next.



**B**EAUTIFUL Bronx-Whitestone Bridge, fourth largest suspension span, provides fast, direct connection between Long Island and Bronx-Westchester-New England points. To speed rapidly growing traffic and eliminate bottleneck from 3-lane approaches, New York's progressive Triborough Bridge Authority recently completed widening the separated 27½-ft. bridge roadways to 30 ft. 9½ in., by eliminating the little-used walkways and extending the roadway to include all available space on the bridge. At the same time, a truss was erected the full length of the main bridge for additional stiffening.

On its outstanding 20-year performance record in highways and structures, 'Incor'\* 24-Hour Cement was used in roadway widening. Many years and many miles of good highway service make America's FIRST high early strength Portland cement the logical choice, for initial economy and long-time dependability.

\*Reg. U.S. Pat. Off.

Bronx-Whitestone Bridge—Triborough Bridge Authority. Consulting Engineers: Madigan-Hyland, Long Island City. General Contractor: Woodcrest Construction Co., New York. Ready-Mix 'Incor' Concrete: Colonial Sand & Stone Co., New York.



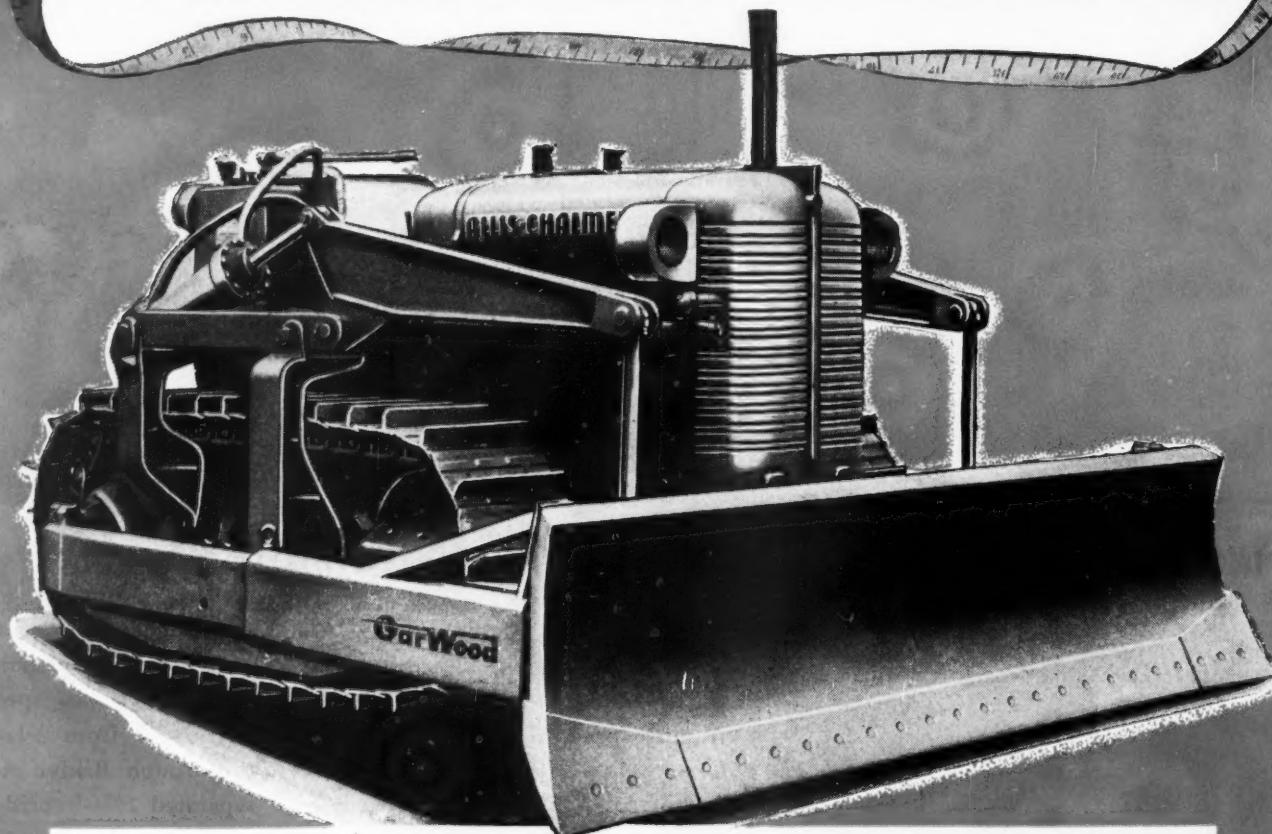
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Performance against performance . . . just measure the difference . . . and see for yourself just HOW FAR AHEAD OF THE FIELD GAR WOOD ROAD MACHINERY REALLY IS.

Owners all over the world and the men who operate them will tell you the same story every time. Gar Wood is ahead by miles. In mining, quarrying, lumbering, railroading

and general contracting GAR WOOD ROAD MACHINERY means dependability, rugged strength, less down time, precision engineering, practical operating costs — all factors that put Gar Wood far out in front of the field.

Gar Wood Dozers, Dozecasters, Rippers, two and four wheel Scrapers are sold and serviced by Allis Chalmers Dealers everywhere.



**GAR WOOD INDUSTRIES, INC.**  
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DITCHERS AND SHOVELS . . . HEATING UNITS . . . BOATS . . . GENERAL OFFICES: WAYNE, MICHIGAN

# RAILROAD RELOCATION *Rushed with Euclids*

On this 200,000 cu. yd. contract for relocating main line road bed of the Nashville, Chattanooga and St. Louis Railway north of Cartersville, Ga., MacDougald Construction Company of Atlanta used 6 Bottom-Dump and 3 Rear-Dump Euclids, and a Euclid Loader. Work was begun in September and completed in November, 1946 under supervision of R. E. Armistead.

About 175,000 cu. yds. of chert containing many boulders were loaded into Bottom-Dumps by the Euclid Loader. Although working in difficult material, Loader production was approximately 395 cu. yds. per hour. Rear-Dump Euclids moved 25,000 cu. yds. of shovel-loaded rock on hauls up to  $\frac{1}{2}$  mile long.

Ability of Euclid equipment to "keep coming back for more" was a very important factor in completing this job ahead of schedule. MacDougald has used "Eucs" on big earth moving jobs in many parts of the country and now owns a total of 19 Bottom-Dumps, 6 Rear-Dumps and 2 Euclid Loaders. Repeat orders from leading contractors like MacDougald are owner endorsements of the fact that Euclids move more yards at lower cost.

Your Euclid Distributor or Representative will provide literature and information on models best suited to your needs.



The EUCLID ROAD MACHINERY CO., CLEVELAND 17, OHIO





THE tougher the job the more you need a Baker . . . for only a Baker Bulldozer gives you the rugged power, sturdy construction, and dependable performance that means low cost yardage on any job.

A Baker's rigid, sturdy construction gives you the heft that is necessary for tremendous down pressure, and terrific pushing power — its simplicity means less linkage, fewer points of wear, less down time—and new machine rigidity throughout the life of the unit.

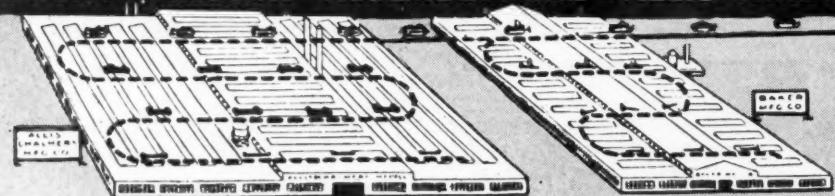
When there's yardage to move and the going is rough — call on a tractor-bulldozer team that has the speed, hitting power and balance you need to lick it — see your nearby A-C Baker distributor today.

**BAKER MFG. CO. • Springfield, Ill.**

# BAKER



## "STRAIGHT THROUGH" ASSEMBLY LINE - ALLIS-CHALMERS TO BAKER TO YOU!



The modern Baker plant with its completely equipped fabricating, machining and blacksmithing shops adjoins the Allis-Chalmers crawler tractor plant. When you order an A-C tractor with Baker bulldozer or graderbuilder, your tractor leaves the A-C assembly line, crosses a narrow court and goes on the Baker final assembly line.

*A development of*  
**B.F. Goodrich**  
**FIRST IN RUBBER**



## B. F. Goodrich off-the-road tires now have double nylon shock shields

IN SPITE OF the worst kind of terrain, users of B. F. Goodrich Rock Service tires like those shown above, have long reported major savings through shock shield construction, B. F. Goodrich's answer to the problem of impact bruises.

Now, double shock shields made of nylon, are used in all large B. F. Goodrich off-the-road tires. The double nylon shock shield consists of four layers of nylon cords between the tread and the plies. These nylon cord layers are in pairs, with each layer of nylon cords running at scientifically determined angles with the other layer to give balanced strength.

The strong, elastic nylon cords in each layer run parallel, fully insulated in live rubber. Under impact the cords in the shock shield stretch together, not across each other, and return to their original position. Because of this principle, impacts are absorbed, distributed . . . the rayon cord body is shielded from shock!

No make of tire other than B. F. Goodrich gives you the added protection of the double nylon shock shield . . . the additional saving through: (1) longer tire life, (2) increased bruise resistance, (3) greater number of recyclable tires, and (4) less danger of tread separation.

There are other advantages in B. F. Goodrich Rock Service tires. The directional tread increases self-cleaning, increases traction! Too, the bars are joined at the center of the tread, providing a continuous riding band that helps eliminate uneven wear. See the B. F. Goodrich man or write us direct. *The B. F. Goodrich Company, Akron, Ohio.*

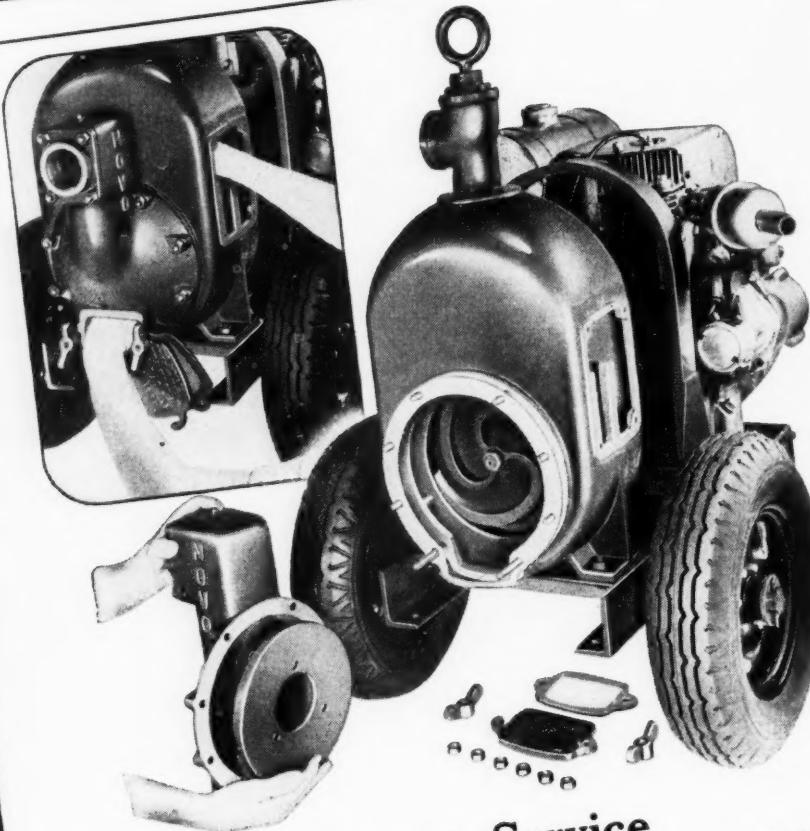
*Truck Tires* **BY**  
**B. F. Goodrich**

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# NOVO NEWS

MAY, 1947



You Can Almost Service This Pump Blindfolded!

Servicing a Novo "Pronto-Prime" self-priming centrifugal pump is simple, quick, and easy. It is not necessary to remove the power unit because pump and engine are independent. It is not even necessary to remove the pump case—or disturb the alignment with the engine—because all wearing parts are accessible through convenient openings. Take off the front cover plate and you

reach the impeller, wear plate, seal, shaft, and bearings. Or leave the cover plate on and remove the cleanout plate (part of the cover) and you have direct access to the recirculating priming valve.

To check the clearance between the impeller and wear plate, take off the hand hold plate on the side. This same opening also enables you to get at the cutoff which is replaceable to provide a ready means of restoring proper clearance with the periphery of the impeller.

These features—together with the proven performance together with records of this new and different pump—mean less "down-time" and more hours on the job.

**Other Novo Equipment**  
 Novo contractors' equipment includes diaphragm pumps, pressure pumps, hoists, generator sets, pavement breakers, traffic line-markers, and engines.

**NOVO**  
 ENGINE COMPANY  
 LANSING 6, MICH. U.S.A.  
**CONTRACTOR'S EQUIPMENT**  
 • GRAY IRON CASTINGS •  
**ENGINES**



Allied Member of A.E.D.

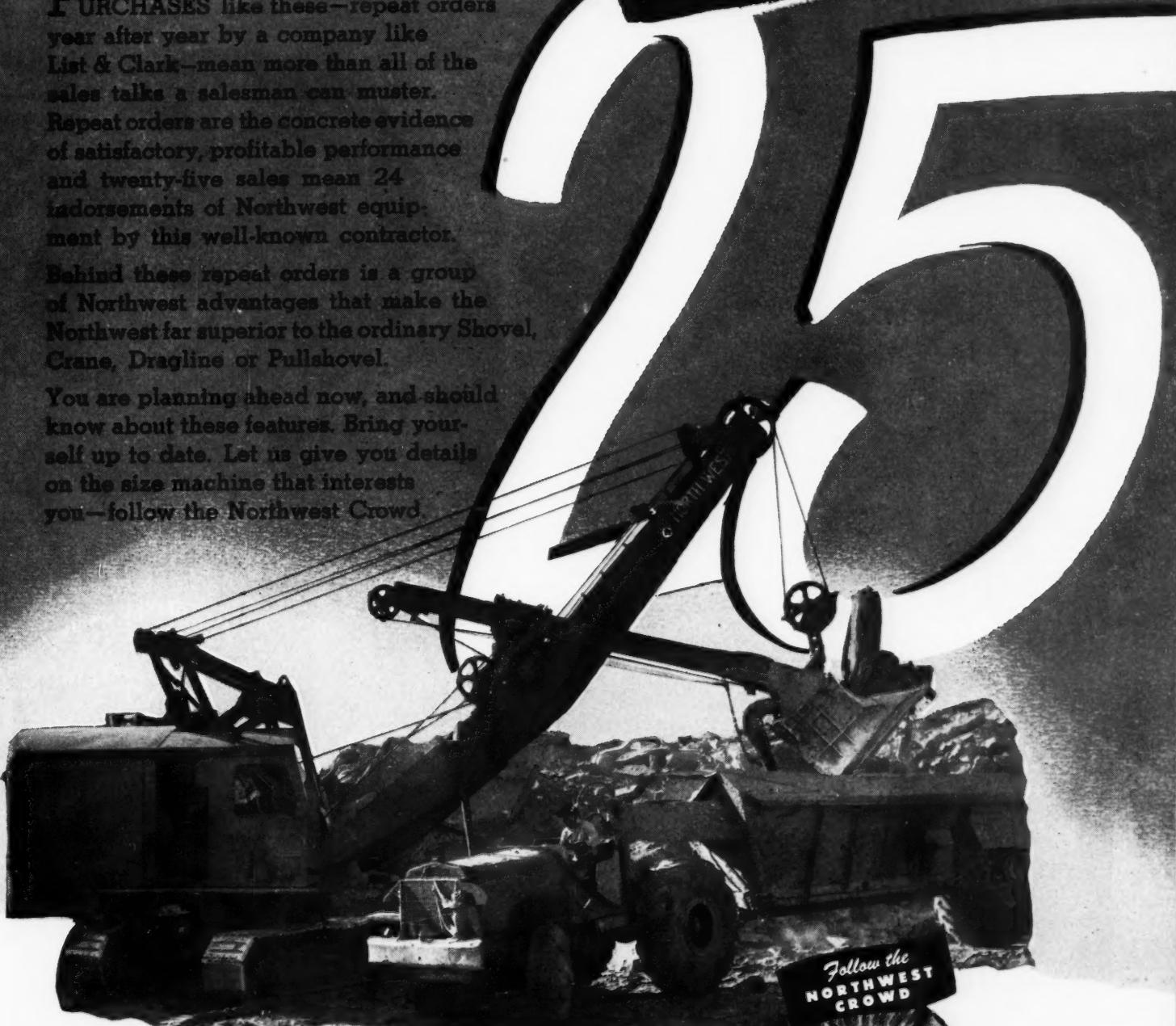
# Another Big Name Buys Again!

List & Clark Construction Co.,  
Kansas City, Mo.,  
Buy Two More,  
Making 25 NORTHWESTS

PURCHASES like these—repeat orders year after year by a company like List & Clark—mean more than all of the sales talk a salesman can muster. Repeat orders are the concrete evidence of satisfactory, profitable performance and twenty-five sales mean 24 endorsements of Northwest equipment by this well-known contractor.

Behind these repeat orders is a group of Northwest advantages that make the Northwest far superior to the ordinary Shovel, Crane, Dragline or Pullshovel.

You are planning ahead now, and should know about these features. Bring yourself up to date. Let us give you details on the size machine that interests you—follow the Northwest Crowd.



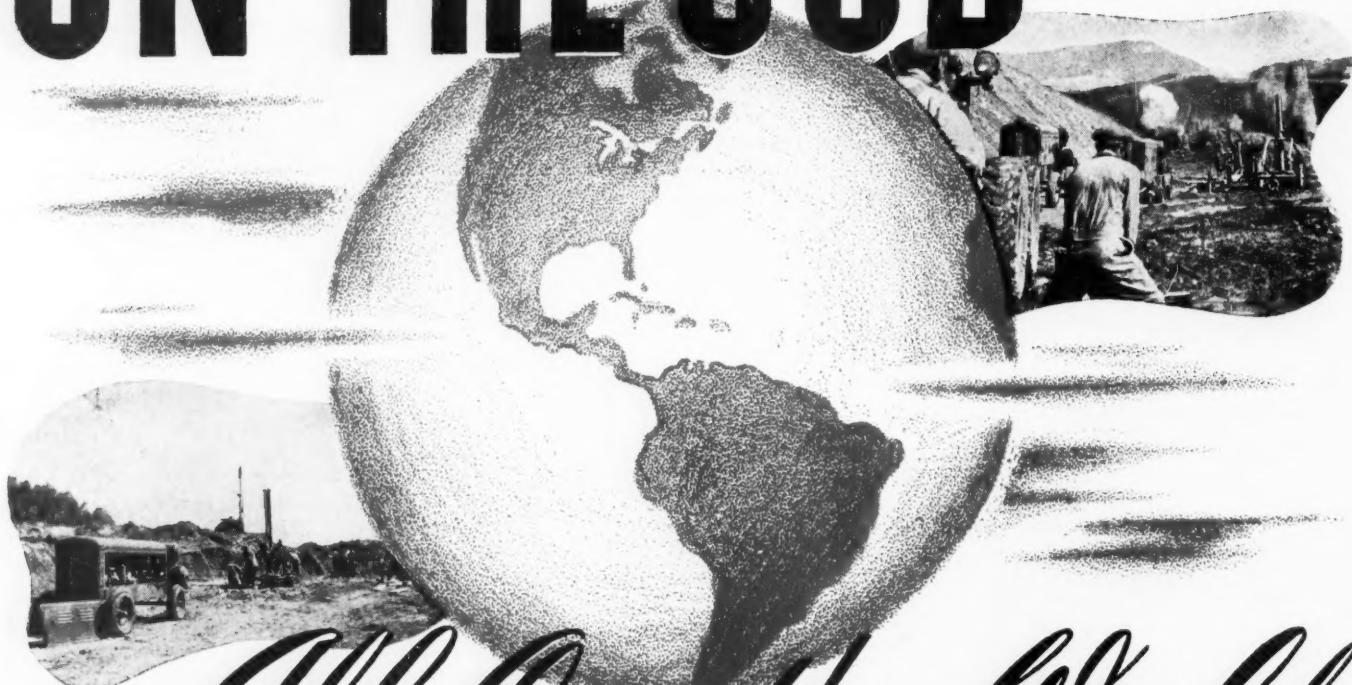
NORTHWEST ENGINEERING COMPANY  
1503 Field Building • 135 South LaSalle Street • Chicago 3, Illinois

# NORTHWEST

SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

If you have a  
REAL ROCK SHOVEL  
you won't have to  
worry about  
output in dirt

# ON THE JOB.



## • All Over the World

No location is too remote or job too tough for a rugged *Schramm Air Compressor*. Construction and maintenance industries throughout the world today, rely on *Schramm* built units.

Precision manufacturing, quality materials and modern design are combined to give you a dependable trouble free unit. Unfaltering air delivery is certain even under the most adverse conditions of climate or locality.

Our engineering staff is at your service—ask them for recommendations concerning your air problems.



## SCHRAMM INC.

THE COMPRESSOR PEOPLE  
WEST CHESTER  
PENNSYLVANIA

Air

WHERE, WHEN AND AS MUCH AS YOU NEED.

# "OUR TRUCKS REALLY 'Hit the Ball'"



## WITH OUR ML4 MOBILoader DIGGING AND LOADING"

**S**PED IS THE KEYNOTE on road projects. Time saved is money saved. That's why contractors and highway officials are "going for" the new ML4 MobiLoader!

Ray R. Harden, County Engineer of Anderson County, Kansas, watches their new ML4 MobiLoader at work digging and loading from hard gravel-clay bank.

Ray R. Harden, County Engineer of Anderson County, Kansas, enthusiastically says, "Our trucks really 'hit the ball' with our ML4 Athey MobiLoader digging and loading." Their ML4 MobiLoader digging and loading in hard material keeps eight trucks "humping it" eight to ten hours a day hauling gravel-clay mixture to county road jobs. Athey MobiLoaders, with the new "Finger-Tip" hydraulic control, dig and load faster because they provide straightline, overhead operation. They strip and load overburden; load gravel, sand and stone; load earth on highway construction, and many more profitable jobs. You'll be time and money ahead by replacing former digging and loading methods with the new ML4 MobiLoader. Learn the complete story on this modern tractor-loader at your Athey-Caterpillar Dealer, or write direct to

ATHHEY PRODUCTS CORPORATION, 5631 West 65th St., Chicago 38, Illinois

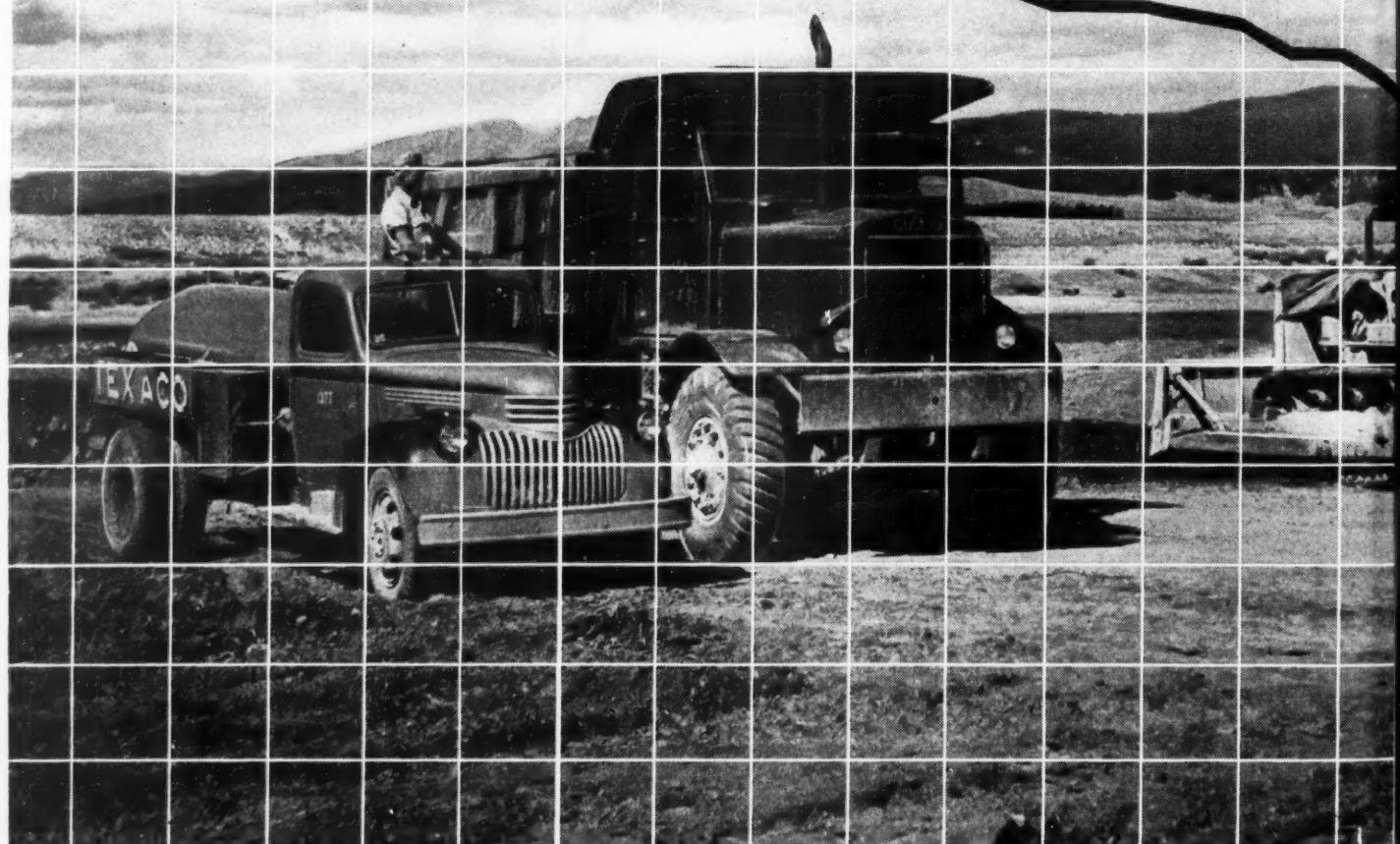


# Athey ML 4 MOBILoader

# REDUCE YOUR

OPERATING

COSTS

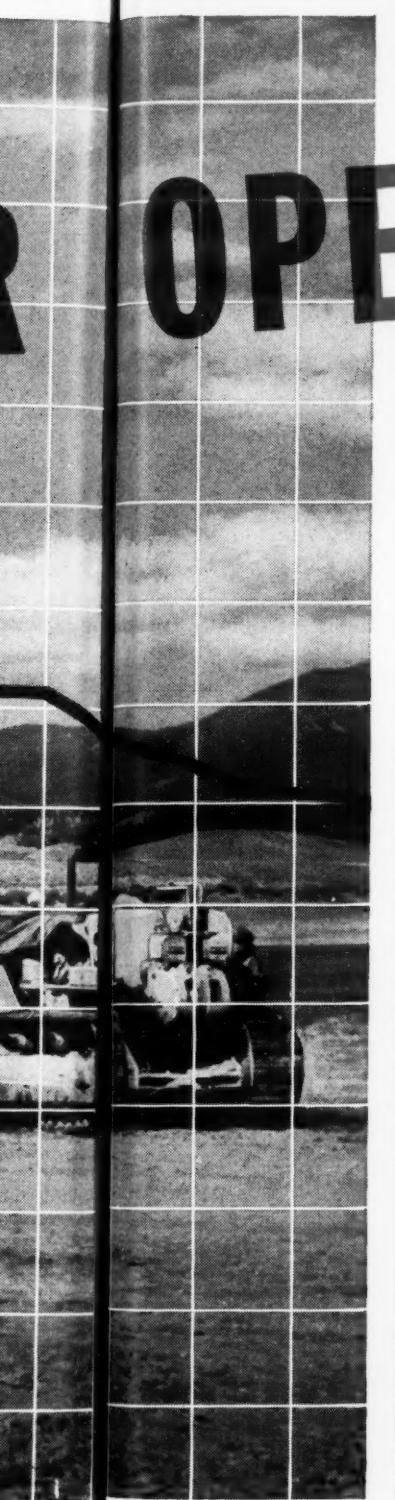


Tune in . . .  
TEXACO STAR THEATRE  
presents the NEW  
TONY MARTIN SHOW  
every Sunday night.  
See newspaper for time  
and station.



# TEXACO

# OPERATING COSTS



**E**FFECTIVE lubrication cuts operating costs of heavy-duty Diesel and gasoline engines by assuring efficiency . . . reducing out-of-service time for repairs and overhauls . . . keeping fuel consumption low. You get all these benefits of effective lubrication with *Texaco Ursa Oil X\*\**.

*Texaco Ursa Oil X\*\** is fully detergent, dispersive, resistant to oxidation . . . made to keep engines clean . . . free from power-stealing sludge, varnish, carbon. *Ursa Oil X\*\** keeps valves lively and rings free . . . protects parts against wear and bearings against corrosion.

Texaco has lubricants and fuels for all contractors' needs . . . and a Simplified Lubrication Plan that adds economy to improved performance. Call the nearest of the more than 2500 Texaco distributing plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

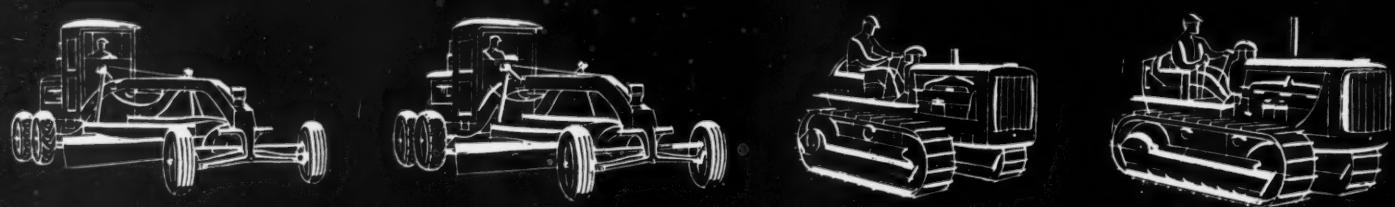
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Lubricate trucks, tractors, graders, shovels and other equipment with the world-famous chassis lubricant — *Texaco Marfak*. It's longer lasting because it won't squeeze out under heavy loads, won't jar out in rough service. *Marfak* seals out dirt and moisture, too . . . protects parts better with fewer applications.

*More than 250 million pounds of Marfak have been used to date!*

## Lubricants and Fuels FOR ALL CONTRACTORS' EQUIPMENT

# A new "FIGHTING FOUR"!



**N**ow on the production lines are four new "Caterpillar" Diesel Tractors and Motor Graders—with decisively greater horsepower, strengthened design, and many mechanical refinements. All brought to you in line with "Caterpillar's" policy of building ever better products for a steadily increasing number of satisfied users!

Without appreciable added weight, but with engines of increased piston displacement, still tougher materials, free-flow manifolding, larger crankshafts and many other improved features,

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CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

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# **GREATER HORSEPOWER**

## **FASTER WORKING SPEEDS**

### **MANY IMPROVEMENTS**

### **HIGHER EARNING CAPACITY**

#### **● The NEW TRACTORS**

##### **The D6**

65 drawbar horsepower  
2600 pounds additional pull in first

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43 drawbar horsepower  
1600 pounds additional pull in first

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36% larger crankshaft journals  
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More effective, single-unit air cleaner  
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##### **The No. 12**

100 brake horsepower

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70 brake horsepower

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Constant-mesh transmission  
Helical gears—for less noise and easier shifting  
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**ENGINES • TRACTORS • MOTOR GRADERS**  
**EARTHMOVING EQUIPMENT**



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**SOME BLOW!** Thor Sinker Rock Drills excel in hole-cleaning capacity—and here's why: "straight-line" design delivers controlled air straight through the heart of the tool *at full pressure*. Teamed up with a harder hammer blow, "straight-line" design means faster penetration, more footage per shift. *Prove this to yourself on your own jobs. Call your Thor dealer for a demonstration.*

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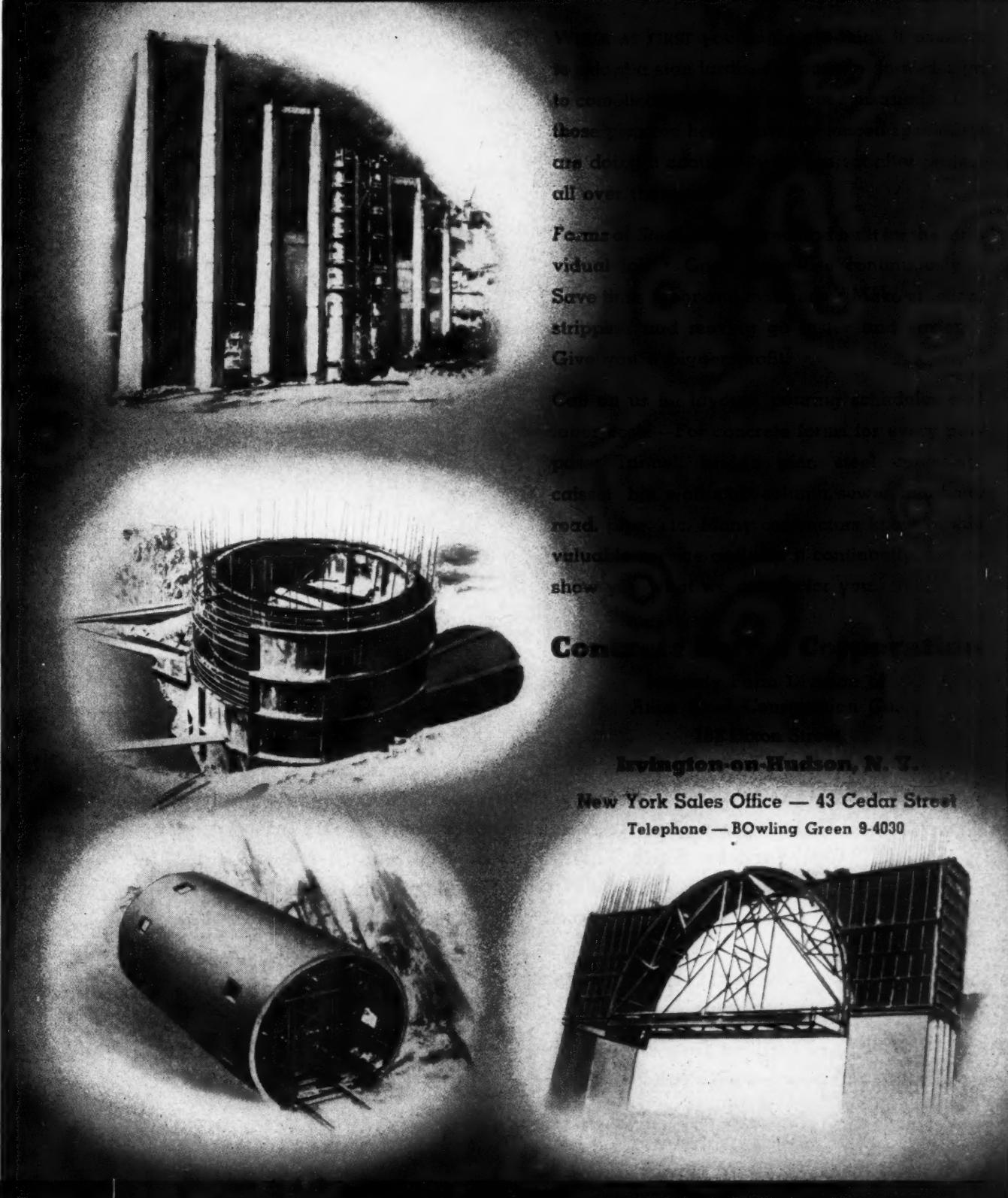


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*Thor*  
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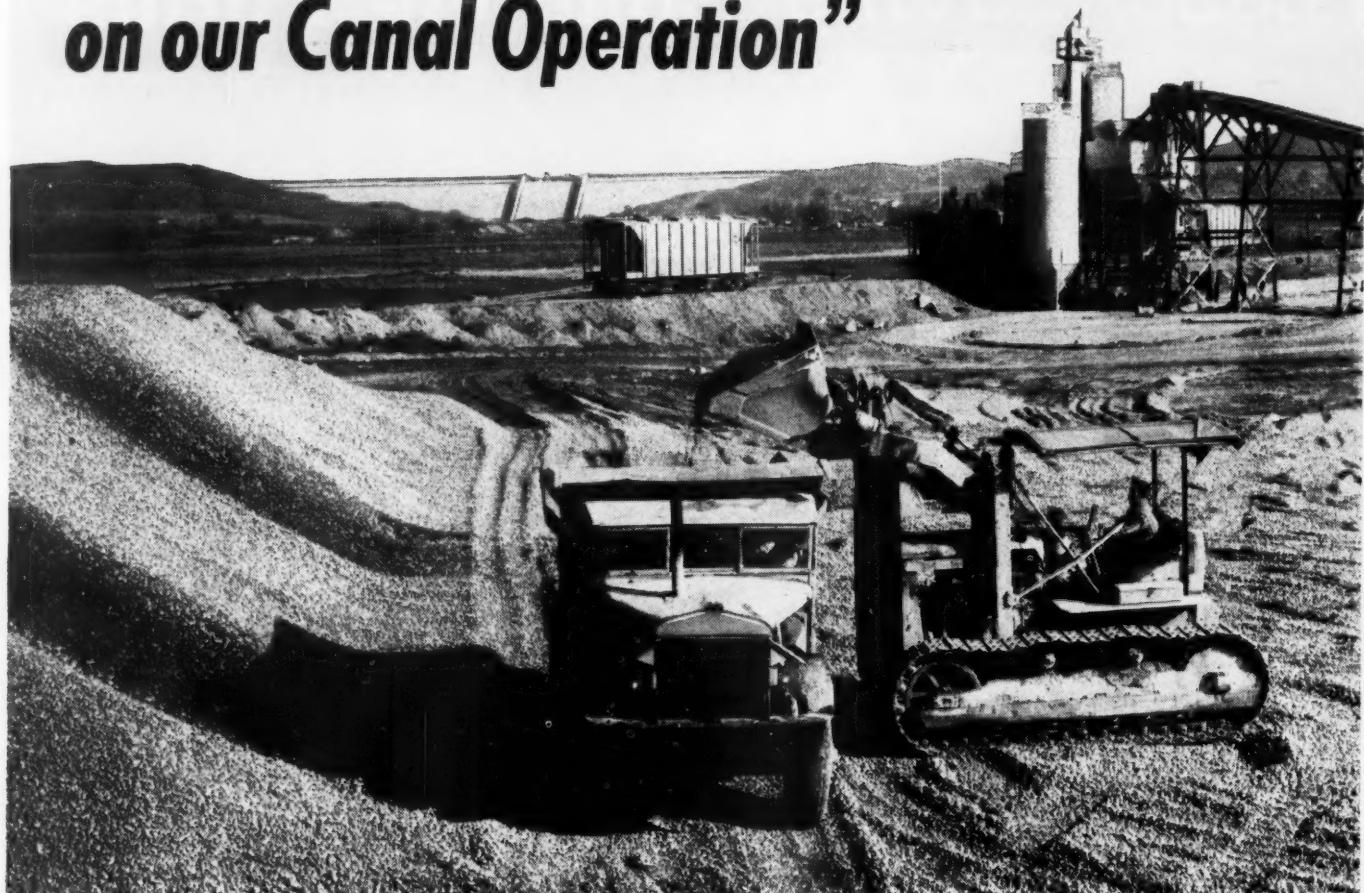
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## Atlas Steel Forms for every Purpose

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**I**N the shadow of Friant Dam, Peter Kiewit Sons Company has set up an 80-cubic-yard-per-hour concrete batching plant for lining their section of the huge Friant-Kern canal. Their T-7 TRAXCAVATOR loads all of the aggregate used—four sizes of rock, gravel and sand—into 10-yard trucks. Keith Wasson, superintendent says, "This TRAXCAVATOR is the *key machine* on our canal operation." The T-7 was also used for preliminary excavating work on the canal and for many necessary clean-up jobs.

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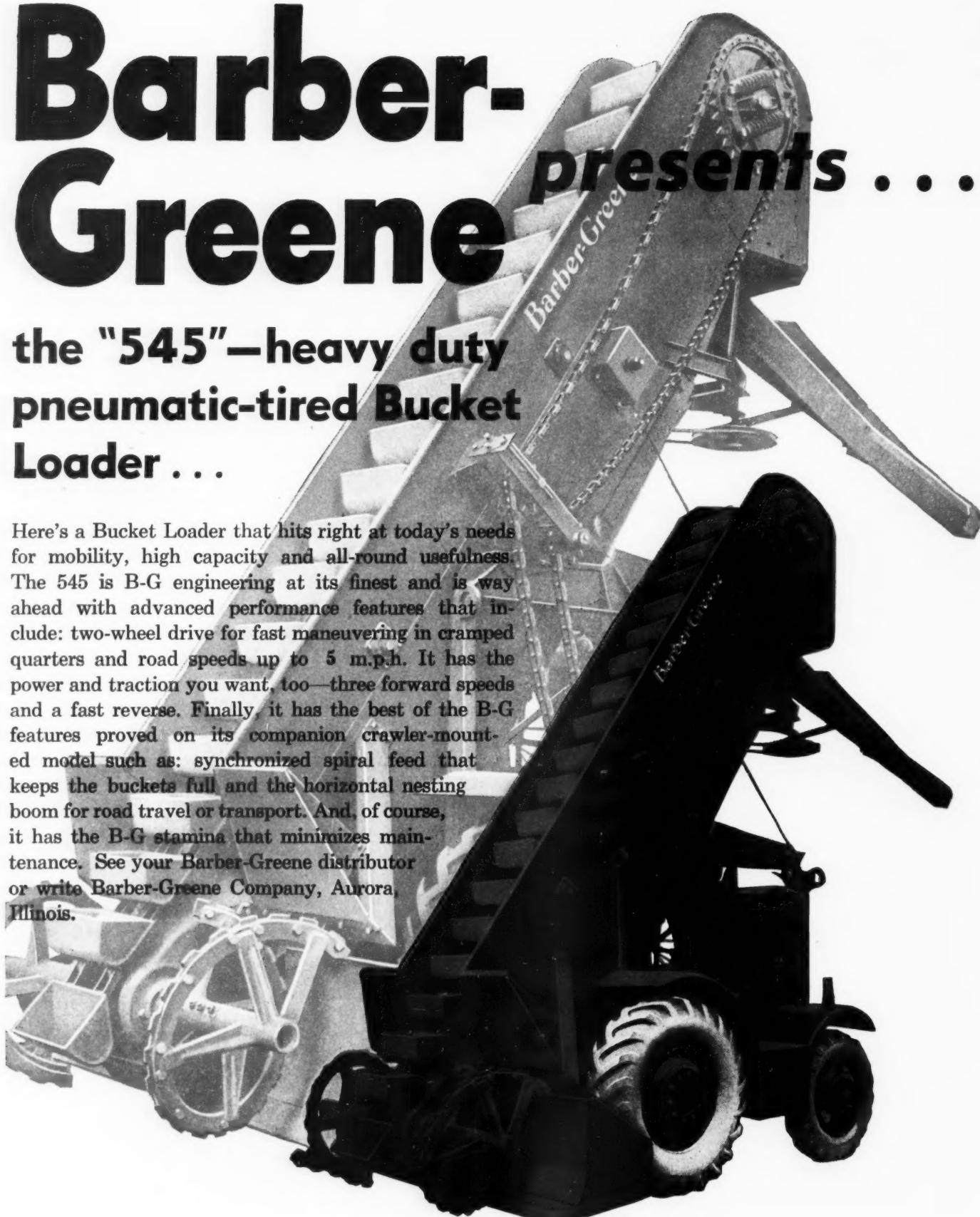
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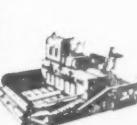
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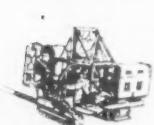
COAL MACHINES



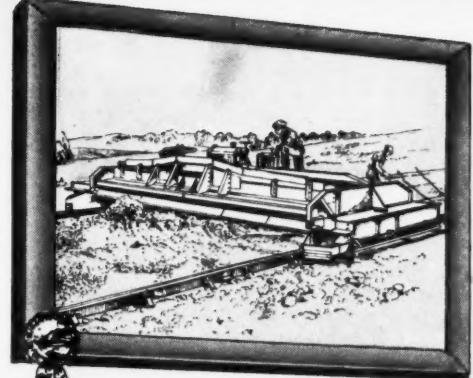
BITUMINOUS PLANTS



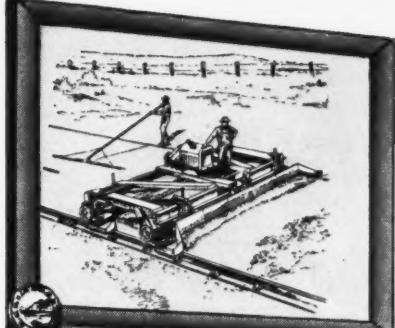
FINISHERS



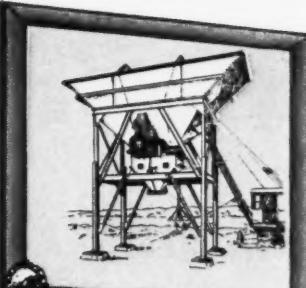
DITCHERS



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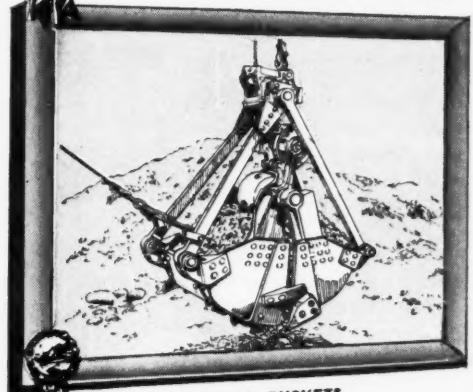
FINISHING MACHINES FOR ROADS & AIRPORTS



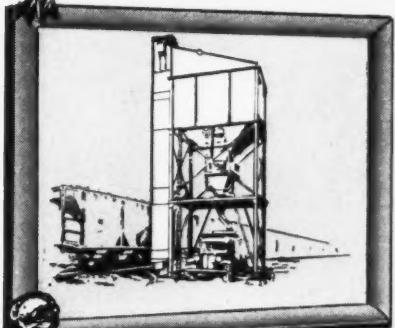
AGGREGATE BATCHING PLANTS



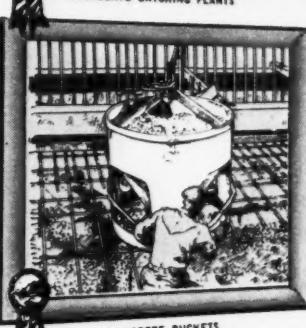
TRUCK MIXERS



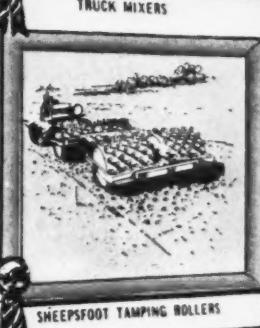
CLAMSHELL BUCKETS



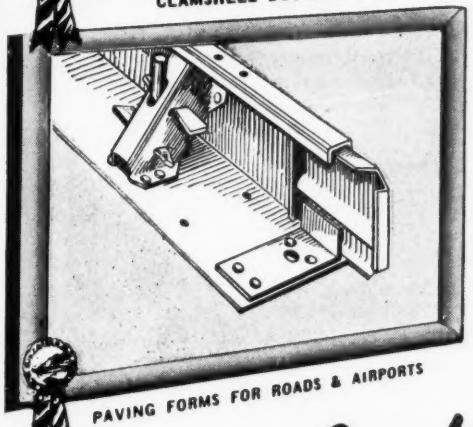
BULK CEMENT PLANTS



CONCRETE BUCKETS



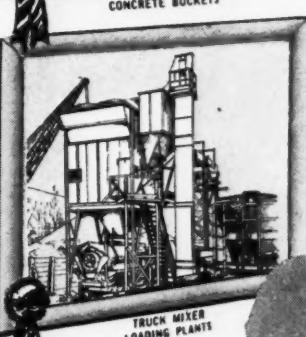
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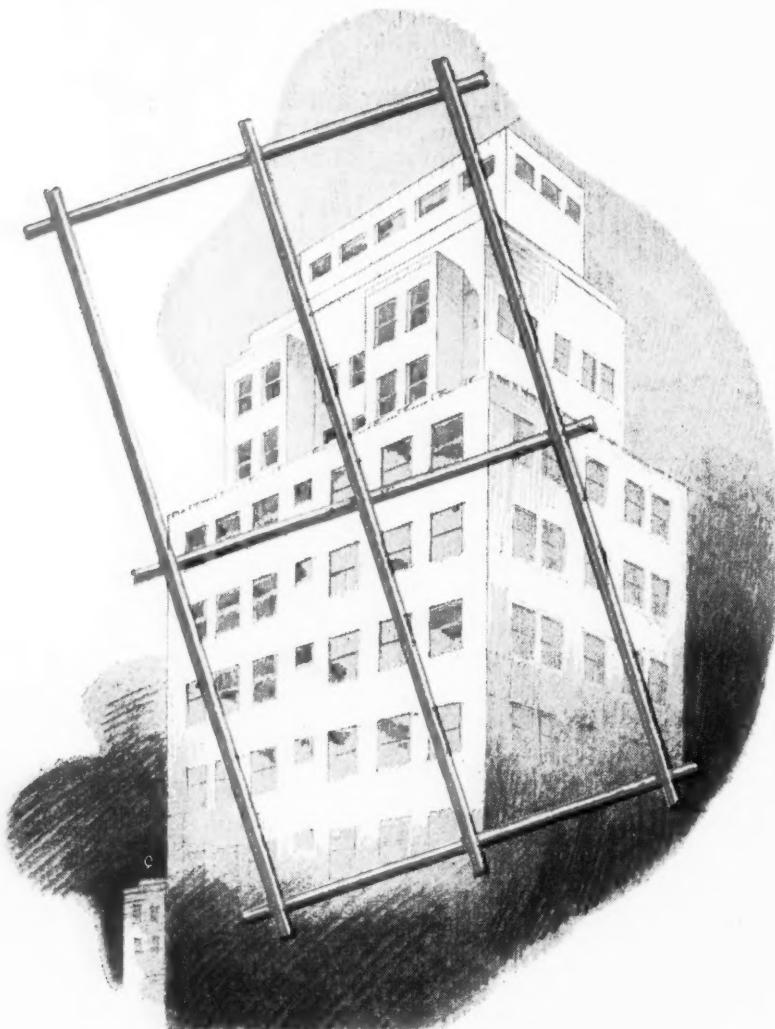
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Every type of concrete construction needs American Welded Wire Fabric reinforcement.



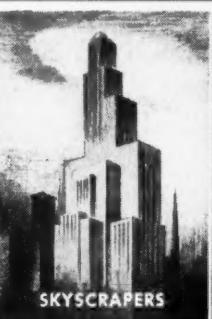
FACTORIES



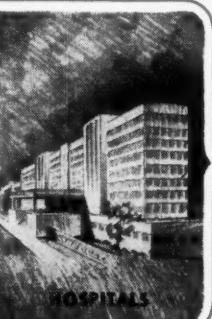
SMALL HOMES



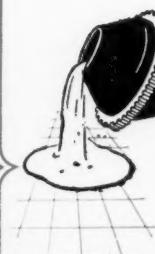
SCHOOLS



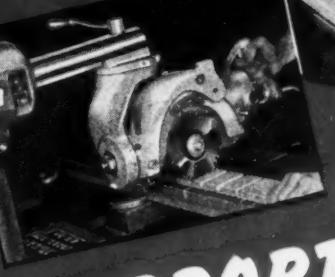
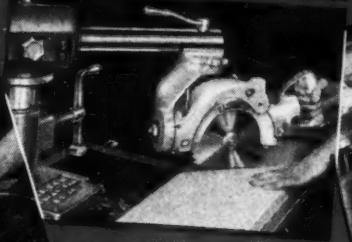
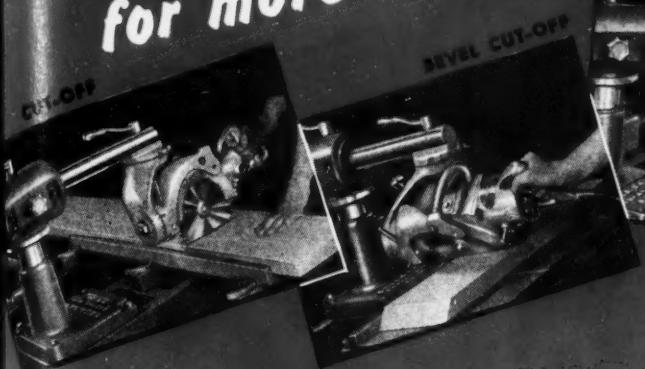
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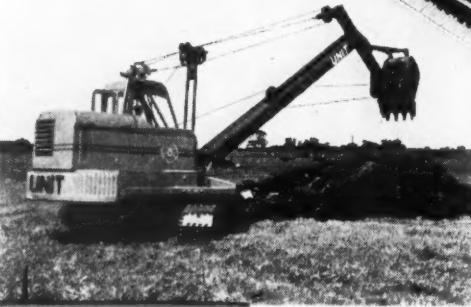
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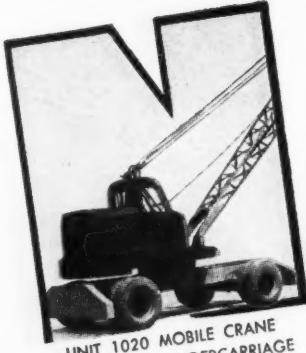


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**5 TO 10 TON CRANES**



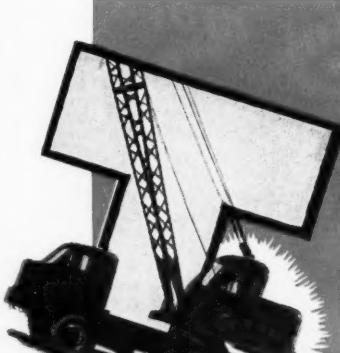
**UNIT 1020 . . . 3/4 YD.  
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**UNIT 1020 MOBILE CRANE  
WITH 2 AXLE UNDERCARRIAGE  
10 TON CAPACITY**



**UNIT 357 MOBILE CRANE  
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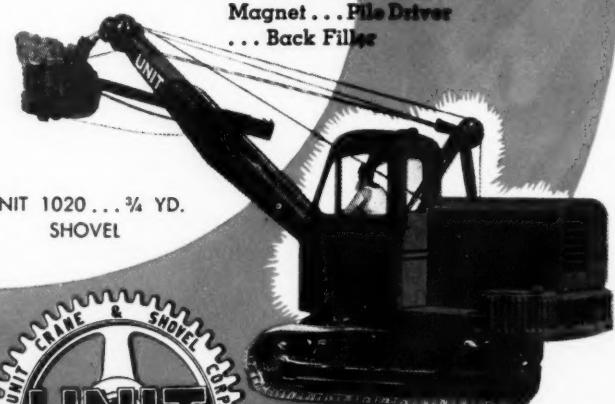
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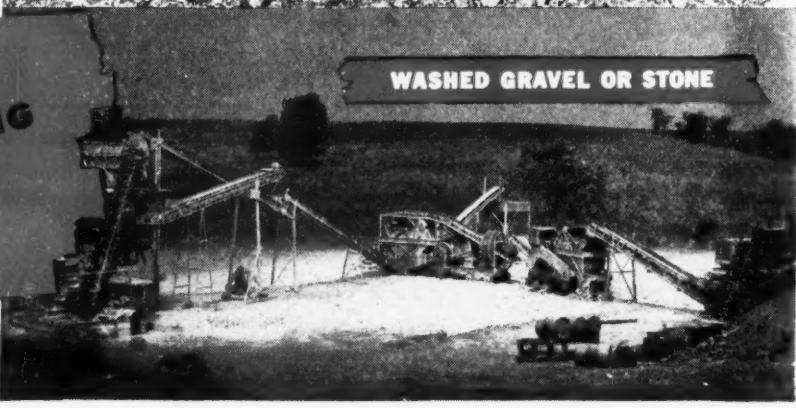
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Modern science reveals many reasons why Red Lead has earned its place as the "standard" metal protective paint.

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**The Film that halts corrosion:** This diagram shows the protective shield, located at the interface of the metal and paint film. The formation and continuous maintenance of this film by Red Lead stops electro-chemical action...inhibits the metal from rusting.

\* \* \*

Remember, too, that Red Lead is compatible with practically all vehicles com-

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The rust-resistant properties of Red Lead are so pronounced that it improves any metal protective paint. So, no matter what price you pay, you'll get a better paint if it contains Red Lead.

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**RED LEAD**

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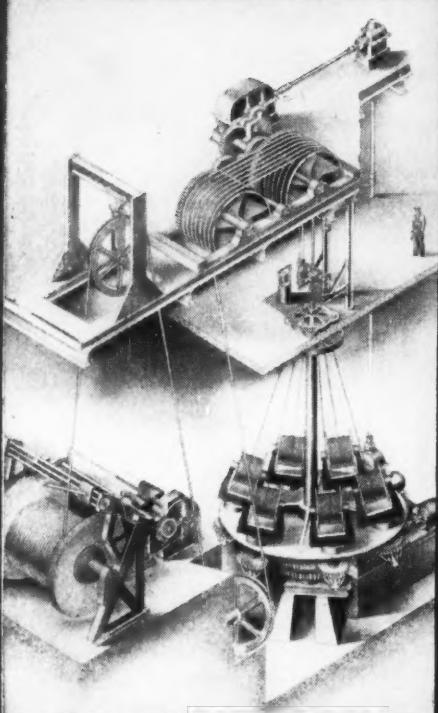
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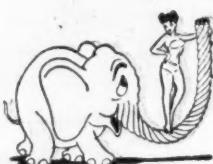
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### UNION-FORMED RESISTS KINKING

. . . because wires and strands are free of internal stress, they do not fight to get out of their pre-formed positions.

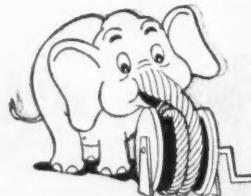


### UNION-FORMED RESISTS BENDING FATIGUE

. . . withstands more bends, even reverse bends, because it is more stress-free internally.

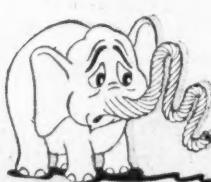
### UNION-FORMED RIDES BETTER ON GROOVES

. . . does not spin and grind through blocks or over sheaves.



### UNION-FORMED IS SAFER TO HANDLE

. . . worn, broken wires do not spring out and porcupine but continue to lie close to the rope.



### UNION-FORMED IS FLEXIBLE AND RELAXED

. . . bends in any direction, yet has "toughness" to withstand jerking and other punishing strain.



# TKH ECO

PLUS TECHNICAL KNOW HOW EQUALS CONSISTENT QUALITY



C. M. ZERR  
CHIEF ENGINEER

Since graduating at Stevens Institute of Technology, he has specialized in all technical and research phases of wire rope making as assistant to Walter Voigtlander. Their technical department is the training ground for operation men, salesmen and technicians.



WALTER VOIGTLANDER  
TECHNICAL DIRECTOR

For 43 years engaged in wire rope technology and research. Under his direction for 20 years, the Union Wire Rope laboratory and technical staff has become widely recognized as the foremost in the industry. From this continuous research comes new rope constructions, new rope making equipment and consistent quality.

Wire rope in itself is a machine. It functions as the steel tendons of many types of machines and to be good it must be made on the most modern of machines. Many of the machines in the Union Wire Rope plant have been either wholly designed or improved by our own mechanical engineers.

These precision machines must be minutely adjusted and maintained in perfect condition to produce uniformly high quality in all of the hundreds of different wire rope constructions. Many years of operating experience is contained in the Union wire rope making formula.

The most vital ingredient is Technical Know How. It is obtainable only from long years of training, experience and continuous research. Ours is an organization of specialists who devote their whole time to wire rope making. It is headed by top flight engineers and technicians who through research are constantly acquiring more know how for use in specifying the finest wire rope making steel; in making every wire rope drawing process improve each heat of steel still further; in constructing wires of the finest steel into stronger, tougher wire ropes, both ordinary and Union-formed (pre-formed); in the development of new wire rope constructions to whip jobs noted as rope killers.

## NEAR YOU THERE IS A UNION WIRE ROPE DISTRIBUTOR AND REPRESENTATIVE CAPABLE OF APPLYING UNION "KNOW HOW" IN THE FIELD

Large and regular doses of "know how" are given Union Wire Rope's field specialists and distributing organizations. They know that Union Wire Rope must do a consistently better job on the job for which it is constructed. Each field specialist, each distributor is fully equipped with a thorough working knowledge of wire rope applications and is capable of making sound recommendations. Each is a substantial

citizen contributing to the economic and social welfare of his community and is an important factor in maintaining the American way of opportunity and freedom unequalled anywhere in the world.

Backed by "know how" specialists, each Union Wire Rope distributor is out to earn and hold your good will.

**union**  **Wire Rope Corporation**

2174 MANCHESTER AVE., KANSAS CITY 3, MO.

FIRM NAME.....

BY.....

ADDRESS.....

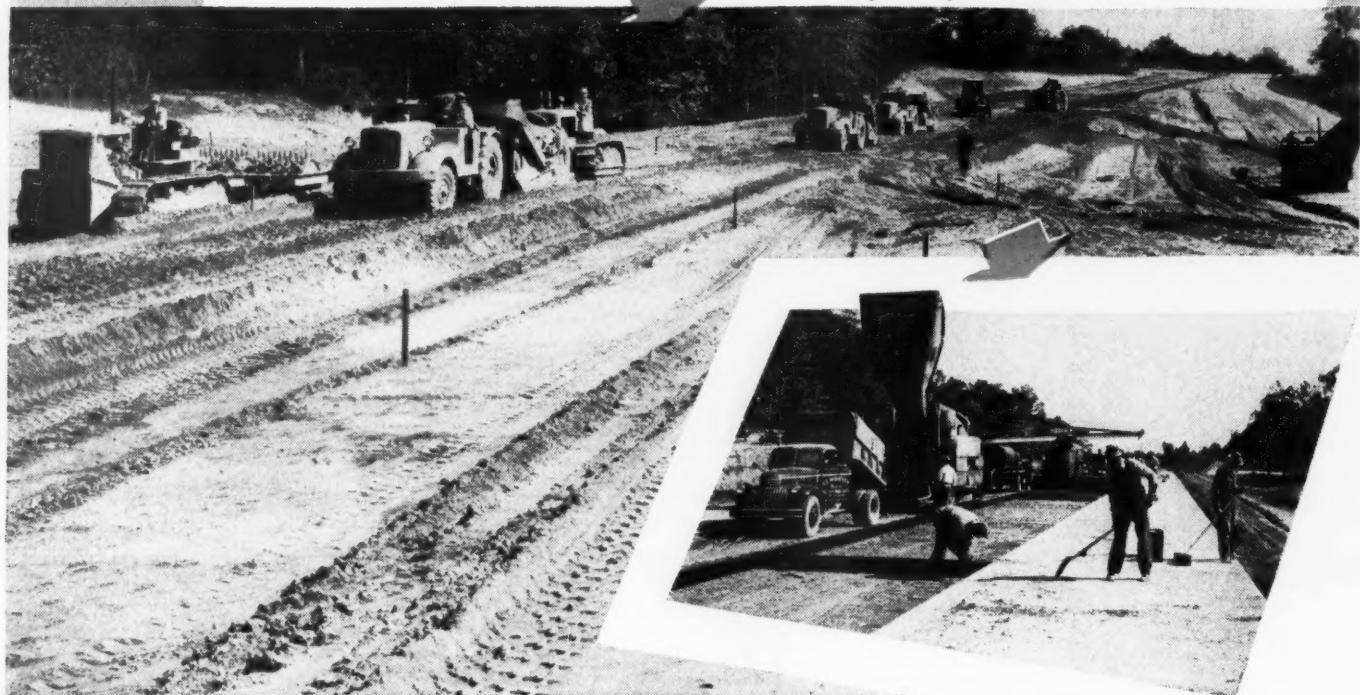
CITY.....

STATE.....

Send "Steel Tendons,"  
the book that gives a pic-  
torial trip through your  
modern plant.

*"Gulf products and fine service  
help us get an extra margin  
of performance from our equipment"*

says Superintendent R. Dunn



The Bero Engineering and Construction Corporation, Buffalo, N. Y., have the contract to rebuild 5.33 miles of Route No. 60 in James City and New Kent Counties, Va. The project involves over 379,000 yards of excavation, and two 24-foot concrete lanes with a 40-foot grass-plot center.

**THIS HIGHWAY PROJECT** is one of many earth-moving and paving jobs where Gulf quality lubricants and fuels work as a team to help contractors make faster progress, higher profits!

Here's why so many leading contractors are partial to Gulf products: They have found that Gulf lubricants provide a higher degree of protection for equipment that's pushed to the limit—and that Gulf fuels are of a uniform high quality

that insures maximum engine performance. Result: fewer delays, more efficient operation, lower maintenance costs, and jobs finished ahead of schedule.

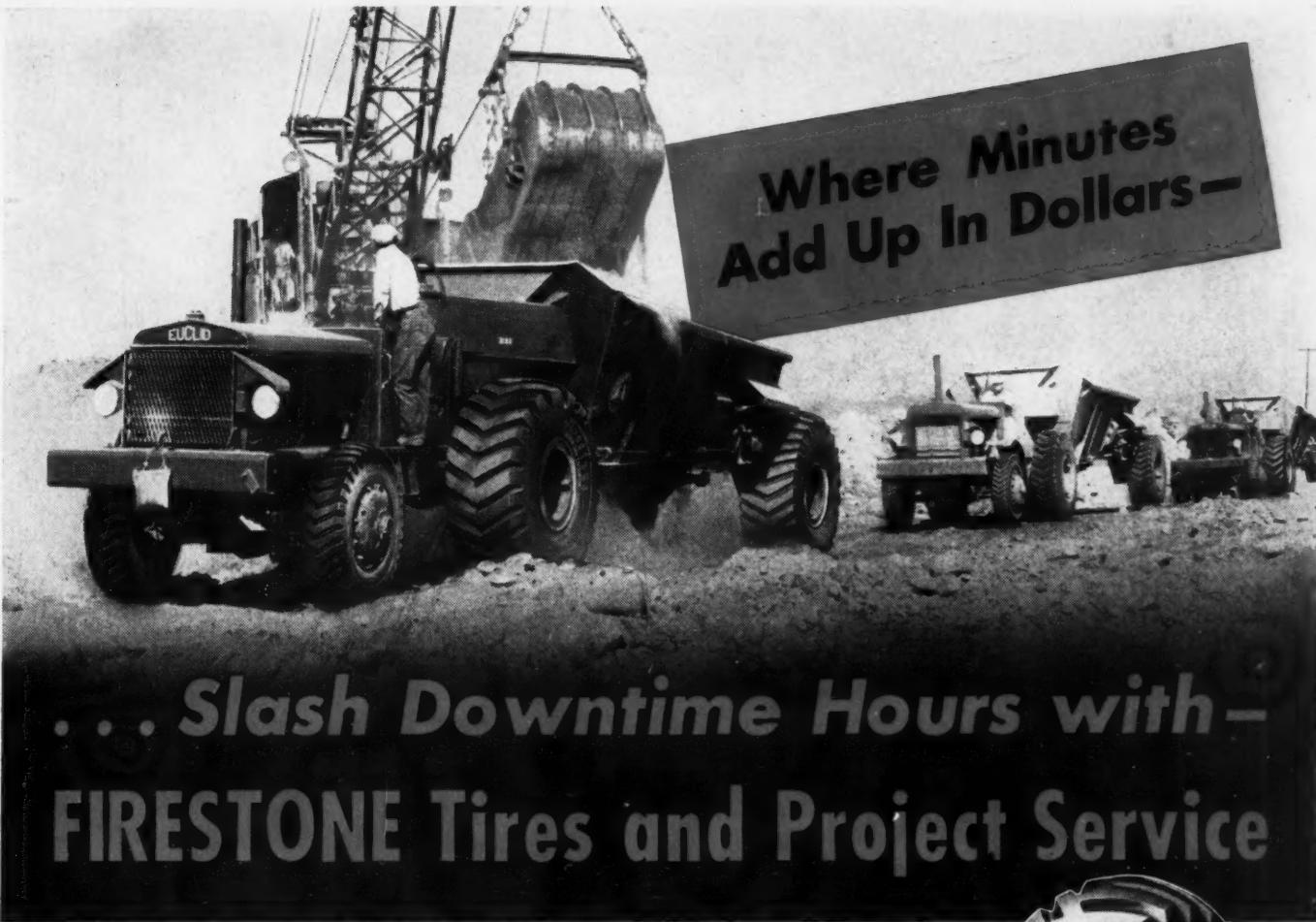
Write, wire or phone your nearest Gulf office today and arrange to use Gulf higher quality lubricants and fuels on your next job. They are quickly available to you through 1200 warehouses in 30 states from Maine to New Mexico.



**Gulf Oil Corporation • Gulf Refining Company**

Division Sales Offices:

Boston • New York • Philadelphia • Pittsburgh • Atlanta  
New Orleans • Houston • Louisville • Toledo



## ... Slash Downtime Hours with- **FIRESTONE** Tires and Project Service

EVERY contractor knows how quickly minutes add up in dollars of lost profit whenever any equipment "goes down" on the job. To avoid downtime due to tire failure, many contractors are using the new Firestone combination—off-the-highway tires and on-the-project service.

**Firestone Project Service is a basic and simple program which pays off in greatly increased production and extra hours of tire life.**

Firestone tire service engineers will analyze your operation, recommend the tires specifically built for that type of work. They will install an inspection and maintenance schedule which will cut your tire costs to the bone. And if you wish, these engineers will assume full responsibility for the successful operation of every tire on your project.

For further details, and without obligation, write Project Service Engineering, The Firestone Tire & Rubber Company, Akron, Ohio.

*Listen to the Voice of Firestone every Monday evening over NBC*

Copyright, 1947, The Firestone Tire & Rubber Co.

**Firestone**  
OFF - THE - HIGHWAY TIRES



# *Your Best Bet*

# INTERNATIONAL



To clear land, cutting out trees at their roots . . . or to move hot slag from an open hearth furnace for a fill . . . these are run of the mill jobs for 'dozer-equipped International Diesel Crawlers.

Bulldogged power, dependability, serviceability and unbeatable operating economy make these tractors your best bet for every job, no matter how tough the going.

Excavate, remove overburden from ore deposits, cut through hills or ridges and build

highways, level land for airports or homesites or any other development. Yes, *move the earth* with International Diesel Crawlers . . . fast and economically.

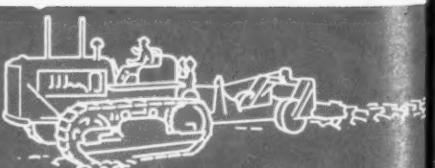
Ask the nearest International Industrial Distributor for specifications or other information. Let him help select your power and equipment.

*Industrial Power Division*

**INTERNATIONAL HARVESTER COMPANY**  
180 North Michigan Avenue  
Chicago 1, Illinois

CRAWLER TRACTORS  
POWER UNITS  
DIESEL ENGINES  
WHEEL TRACTORS

# INTERNATIONAL



# *for Every Job*

## Diesel Crawlers

→ Burnash Construction Company of Flint, Michigan, owns 10 International Diesel Crawlers and one gasoline wheel tractor. Freeman C. Burnash says: "The reasons I have only International equipment are: 1. The excellent service received from the distributor. 2. A lot faster machine. 3. Parts are more easily replaced as we don't have to take the whole machine apart to replace them. As long as this continues, our company will use only International equipment." The photograph on the opposite page shows one of the company's TD-14's working on a land clearing job for a housing project.

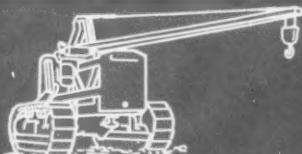


↑ In Cleveland W. E. Plechaty's two International TD-14 Diesel Crawlers saved time and cut costs of moving hot open-hearth slag to fill a 5-acre hole for a building site. 18 carloads are handled each day.

Tune in James Melton on "Harvest of Stars" every Sunday, NBC Network



## Industrial Power



# THE BIG CONSTRUCTION PROGRAM IS ON!



KABLE TRAC-DOZERS—are available in either 'Straight' or 'Angle' blade models and can be used with single or double drum, front or rear mounted, power units.

## ISAACSON KABLE TRAC-DOZERS

### Can take it and like it!

Construction is on the move. Grueling work schedules are the order of the day with contractors. But so are bedrock economies! Now comes the showdown on equipment. Tractor equipment is "under the gun" to produce results at a profit or bow out to the kind that can take it and like it. . . . ISAACSON KABLE TRAC-DOZERS are that kind of equipment. "Pay-dirt" performers from start to finish. Producers that see you through to a profit.

They've got more than quality materials and workmanship. They've got more than extra-rugged construction. They've got engineered balance—the perfect coordination between tractor and equipment that eliminates breakdowns and costly delays, uses every ounce of power without excessive wear. They've got what it takes to stand up on the toughest earthmoving jobs in the world—and save money.

That's why the biggest contractors say: "For operating economy, give us Isaacson tractor equipment. For equipment that gets more out of a tractor and takes less, give us Isaacson." For profitable performance, Isaacson is the buy-word of the day.



For further information, see your INTERNATIONAL INDUSTRIAL POWER DISTRIBUTOR

# ISAACSON

Tractor Equipment

A PRODUCT OF THE ISAACSON IRON WORKS • SEATTLE

# CONFIDENCE...how much is it worth?



**I**N 1846, twenty three years before the Golden Spike was driven at Ogden, Utah marking the completion of the first transcontinental railway, John August Roebling built America's first truly practical, wire rope suspension bridge. This bridge, which carried traffic across the Monongahela River for scores of years, stood as a silent testimonial to his confidence in a principle of bridge building which, in that day, was looked upon with considerable misgiving.

How much is this confidence worth to bridge engineers, and to humanity as a whole, today?

Had it not been for his confidence there would have been no Brooklyn, George Washington nor Golden Gate Bridges. Had it not been for your confidence in the company that bears this pioneer's name, there could have been no John A. Roebling's Sons Company.

Your confidence is valued above all of this company's assets. Every Roebling employee's job depends upon his ability to preserve that confidence by producing better products and by giving you better service than you can find elsewhere.

Any product is only as good as the organization that makes it.

## For the Right Rope for Your Equipment Choose a "Blue Center" Steel Wire Rope!

It's easy to find the right wire rope for your job when you can choose from a wide range—the one construction, size, and grade of steel that will give you most service at lowest cost.

That's why, whatever you need in wire rope, you're sure of finding it in Roebling's complete line of "Blue Center" Steel Wire Rope, in either preformed or non-preformed types. Illustrated are just a few of the more commonly

used constructions. Each is the finest we know how to make . . . and each is made of Roebling's famous "Blue Center" Steel.

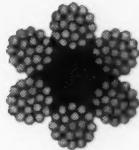
Your Roebling Field Engineer has the broad knowledge and experience needed to help you select the wire rope that will give you greatest returns in dependable, low-cost performance. He's at your service. Call him at our nearest branch office.

**JOHN A. ROEBLING'S SONS COMPANY**

TRENTON 2, NEW JERSEY

Branches and Warehouses in Principal Cities

Manufacturers of Wire Rope and Strand • Fittings • Slings • Screen, Hardware and Industrial Wire Cloth • Aerial Wire Rope Systems • Hard, Annealed or Tempered High and Low Carbon Fine and Specialty Wire, Flat Wire, Cold Rolled Strip and Cold Rolled Spring Steel • Ski Lifts • Electrical Wire and Cable • Suspension Bridges and Cables • Aircord, Aircord Terminals and Air Controls • Lawn Mowers



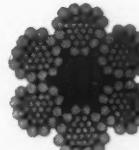
6 x 19 Standard  
Hoisting Rope



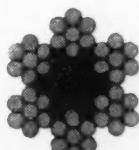
8 x 19 Extra Flexible  
Hoisting Rope



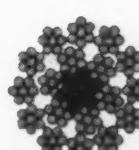
6 x 19 Haulage  
Rope



6 x 30 Flattened  
Strand Rope



6 x 7 Standard  
Coarse Laid Rope



18 x 7 Non-Rotating  
Hoisting Rope

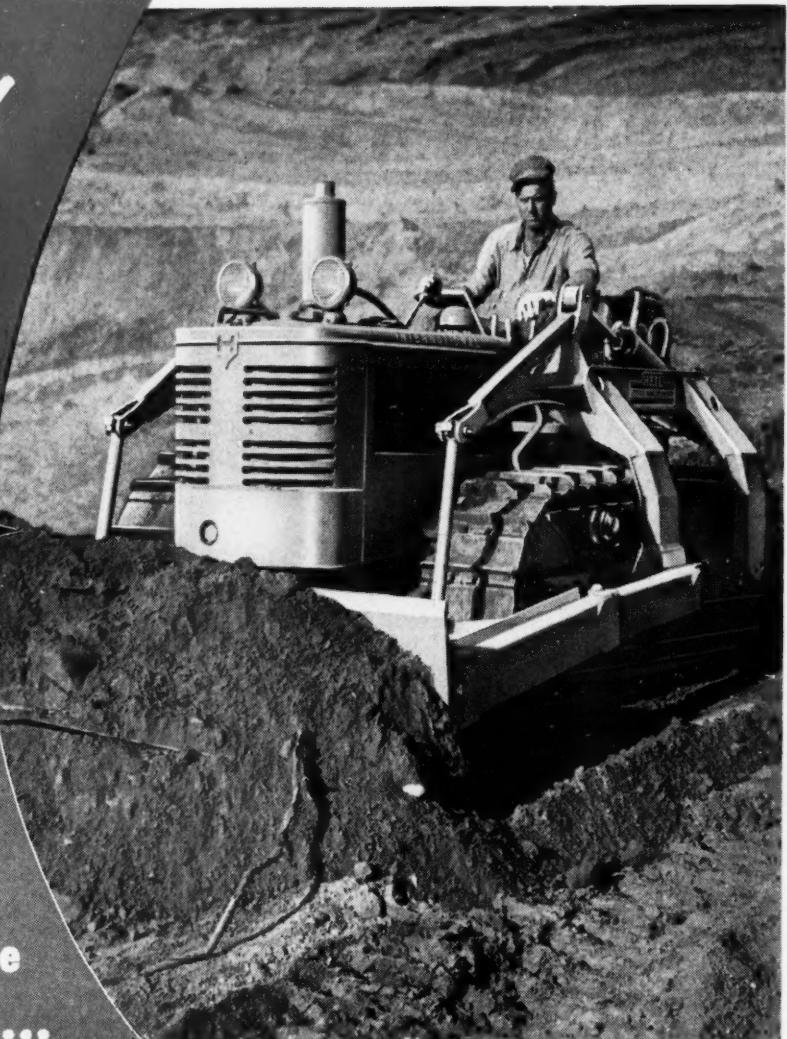
# ROEBLING

A CENTURY OF CONFIDENCE



# *Here's good news for earthmovers*

**The Heil Co. announces  
a NEW Hydraulic Dozer  
—designed especially  
for International TD-9  
and TD-14 Tractors, to  
help them move more  
dirt at lower costs...**



This new hydraulic dozer has the same basic design features found in the popular Heil Cable-dozer — such features as: The one-piece rigid "A" frame for exceptional strength, the scientifically contoured moldboard for moving bigger loads, and easy-to-replace cutting edges for lower maintenance costs, and greater digging efficiency.

The hydraulic system is a single-unit assembly consisting of a pump, valve, and oil tank. This system has proven itself on thousands of jobs in all parts of the country. Some of its advantages are:

- **Quick response to controls** — no lag period.
- **Trouble-free operation and low maintenance costs** — you never have to replace a piston due to wear. Servicing is easy and quick.
- **Stable moldboard** — self-neutralizing valve holds moldboard in any desired position; prevents "bucking" of pressure and overheating of oil, no matter how difficult the job may be.

- **Low hydraulic pressures** — freedom from annoying and troublesome oil leakage.
- **Easy operation** — finger-tip control and complete visibility enable the operator to place the blade just where he wants it — for better, faster digging, or fine grading. Costs are lower.

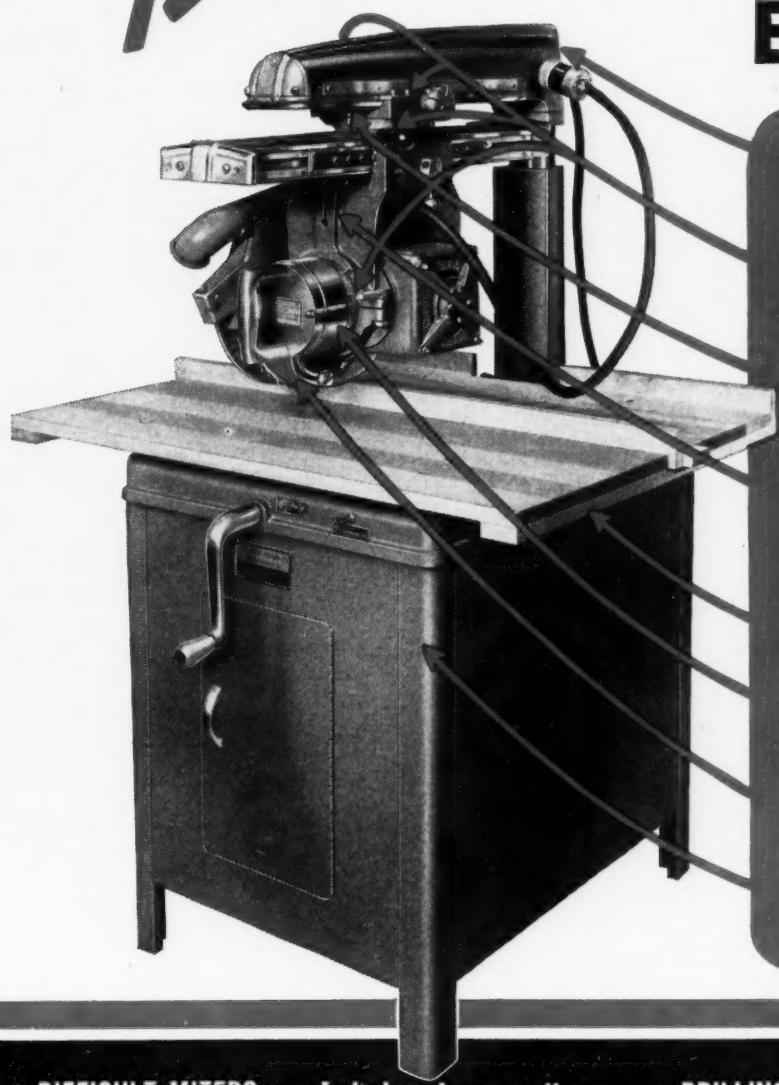
Put this new Heil hydraulic dozer to work. Less down-time means lower maintenance cost. Your International tractors stay busy longer — moving more dirt and making bigger profits for you. See your International Industrial Power Distributor for more facts about this new dozer.

*Write us for latest bulletins.*

R-90

**THE HEIL CO.**  
GENERAL OFFICES • MILWAUKEE 1, WISCONSIN

# ★ Built for - SPEED ACCURACY ECONOMY



**REAR COLUMN AND OVERARM** — Raised and lowered by means of a removable crank at front of table — self-aligning — self-locking.

**RIP, MITER AND BEVEL SCALES** — Accurately calibrated and located at convenient eye level.

**EXCLUSIVE VERSATILE ELBOW** — Center pivoted track rotatable 360° — this provides an infinite number of possible positions.

**BALL BEARING MOUNTED YOKE** — Moves with exceptional ease. The yoke is adjustable to maintain accurate alignment.

**HARDWOOD TABLE** — Equipped with special screws for leveling.

**MOTOR ROTATES THRU 90° IN YOKE** — Can be placed in number of positions for any desired operation.

**SELF-RETRACTING GUARD** — In addition to conventional saw guard.

**METAL CABINET BASE** — Provides storage space for tools, saws, etc.

★ **DIFFICULT MITERS** — Left hand as well as conventional right hand miters are cut with ease. Simply turn the center pivoted track to the desired angle — if bevel miter is wanted merely tip the motor.

★ **CROSS-CUTTING, RIPPING, DADOING, PLOUGHING AND OTHER OPERATIONS** — A single MULTIPLEX will perform almost any wood working operation quickly, accurately, safely.

★ **DRILLING, ROUTING, CIRCULAR ROUTING, SHAPING, TENONING, PLANING, CARVING** — These and many other added operations are possible with the drill press attachment available as optional equipment with the 30A and 40A saws.

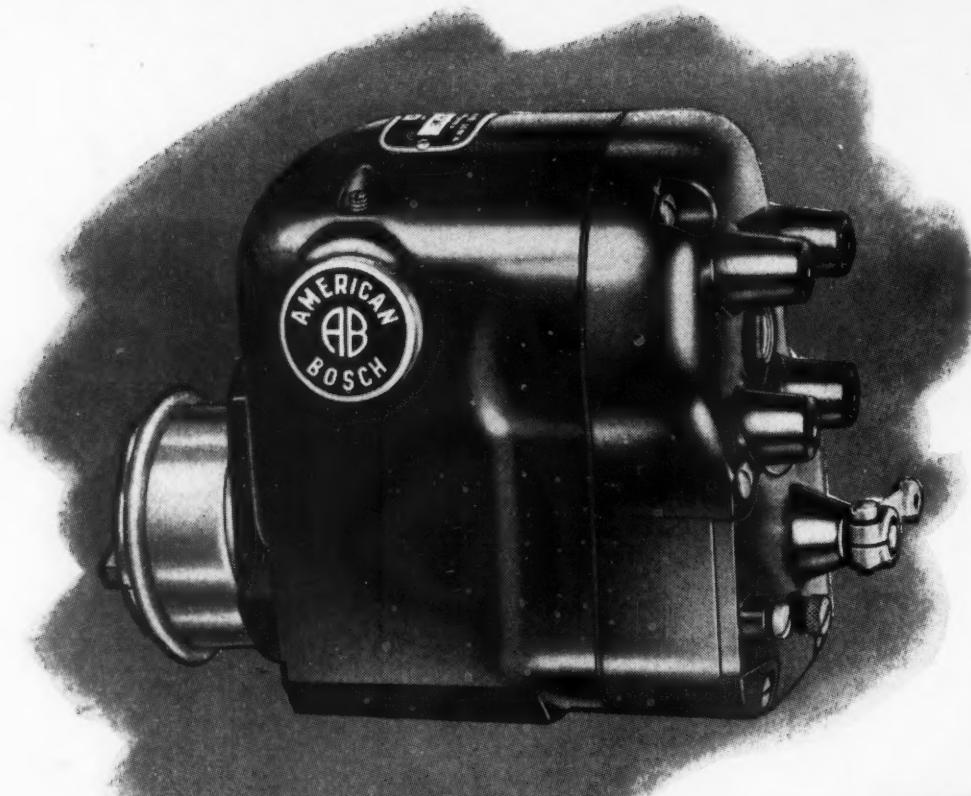
★ **CONTROLS** — All controls on front of machine for safety and convenience — no dangerous space wasting overhanging parts. Speeds up output and lowers operating costs.

Write for further information and name of nearest dealer.

## MULTIPLEX

### Radial-Arm Saws

RED STAR PRODUCTS INC. 3455 VEGA AVE., CLEVELAND 13, OHIO U. S. A.



## What's a Magneto's *True Cost?*

It isn't on the price tag, of course. Cost per year of service is the only true cost...the sum of first cost and all maintenance and "down-time" costs divided by the number of years the magneto lasts.

The true cost of American Bosch Magnetos is a low cost. They are known for dependability...for their ability to stand up for years under the heaviest demands—with only a minimum of care and adjustment.

American Bosch Magnetos are standard equipment on many of America's foremost engines. Users everywhere have learned to look for them as assurance of added dependability—when buying new equipment or replacing worn-out magnetos. Sold and serviced through a nation-wide network of Authorized American Bosch Service Stations. Write for free directory. AMERICAN BOSCH CORPORATION, Springfield 7, Massachusetts.

A M E R I C A N   B O S C H



*Super-Powered Magnetos*

AUTOMOTIVE AND AVIATION ELECTRICAL PRODUCTS • FUEL INJECTION EQUIPMENT



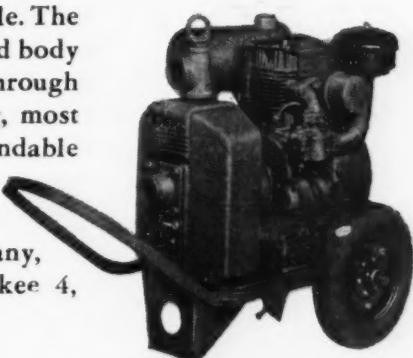
## "Reminds me of my Rex Pump!"

A Rex "Easy-Flow" Pump is "Old Faithful," around any construction job. Just spot it, start it, and forget it. That's all there is to it. Rex will keep right on pumping as long as there's water in the hole . . . not for just one job or for one season, but for many a year of tough, dependable service.

With their new press-formed bodies, Rex Pumps are exceptionally portable . . .

light in weight yet extremely durable. The smooth surfaces of the press-formed body and volute speed the flow of water through the pump. It's the fastest priming, most efficient, most thoroughly dependable pump in the field.

See them at your local Rex Distributor or write Chain Belt Company, 1664 West Bruce Street, Milwaukee 4, Wisconsin, for all the facts.



## CHAIN BELT COMPANY of MILWAUKEE

### CONSTRUCTION MACHINERY



PUMPS



PAVERS



PUMPCRETES



MOTO-MIXERS



MIXERS

# Greater Machine Output—Less Down-Time

## 1 CORRECT LUBRICATION

for every part of every  
machine you operate

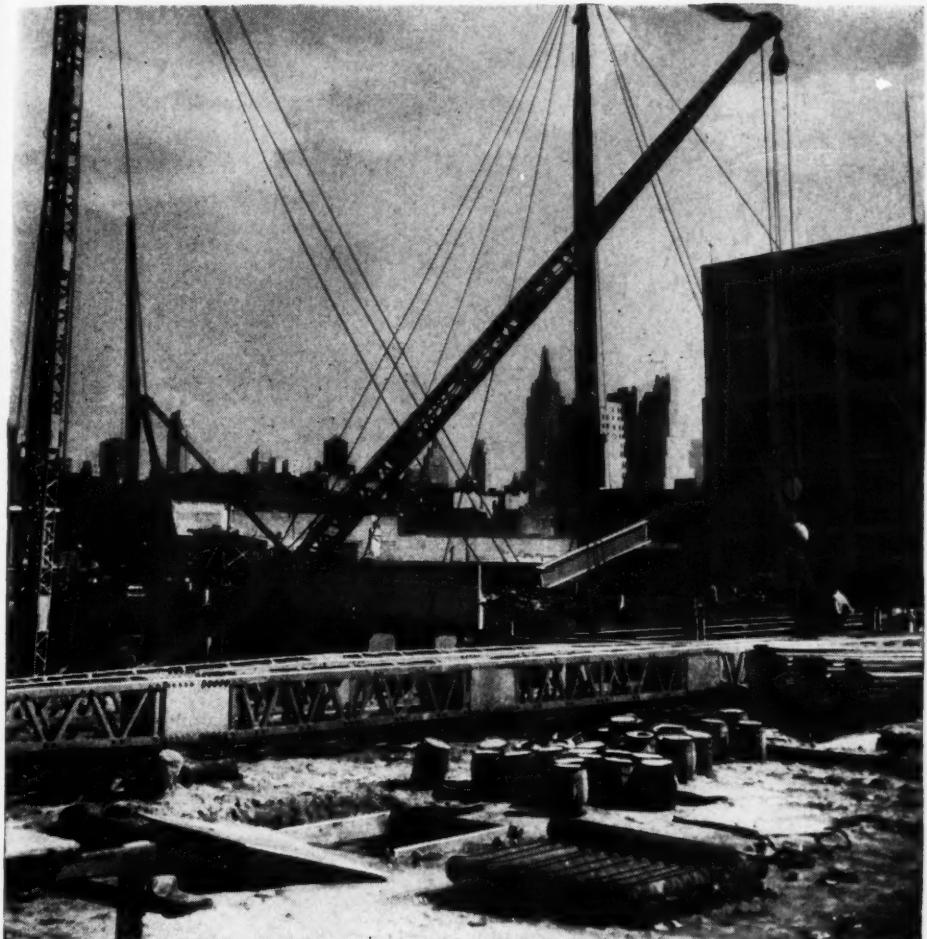
WHETHER YOU USE 7 machines or 70, we can help you minimize equipment failures, speed operations all down the line. We offer: special oils that resist harmful deposit formation and corrosion in high-speed Diesel and gasoline engines; top-quality lubricants to combat heat, friction and wear in all types of gears and bearings; oils and greases that meet the specialized requirements of power tools, air compressors, power shovels, graders — all other types of construction equipment.

For technically *correct* recommendations, call in your Socony-Vacuum Representative.



*Rely on* **SOCONY-VACUUM**  
**CONTRACTORS' SERVICE**

# -THAT'S THE NET OF THIS PROGRAM!



HERE ARE just a few of the ways we help you ease tight work schedules, meet and beat contract deadlines:

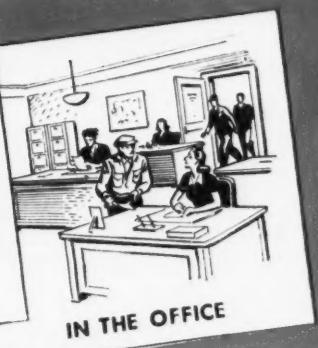
1. Supply you with tested maintenance schedules adapted to *your* equipment, *your* set-up.
2. Give you practical help on "problem" machines.
3. Provide information on the Do's and Don't's of Correct Lubrication.

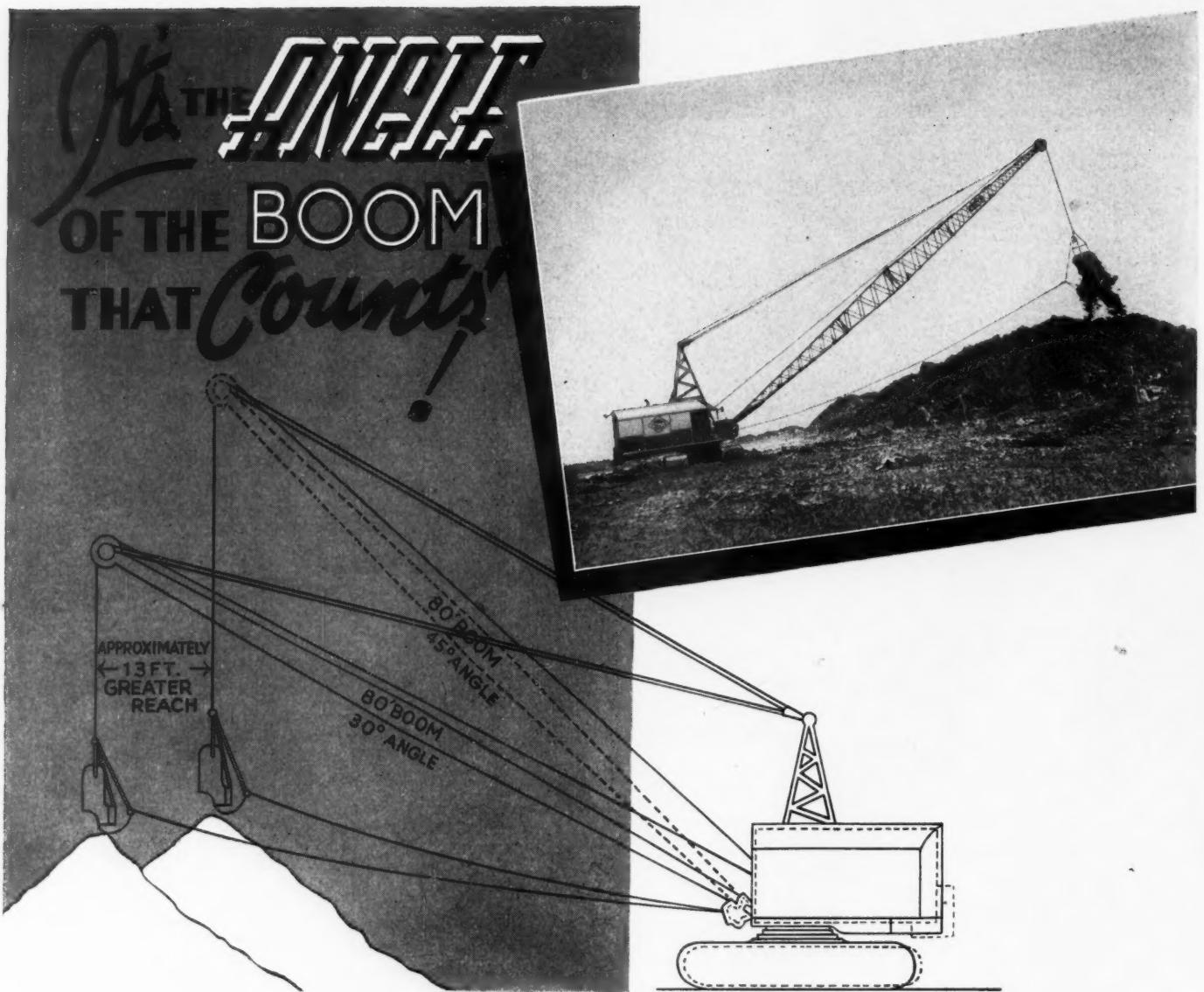
4. Supply the requirements for oils and greases for all of your equipment.
5. Help simplify lubricant inventory problems.

\* \* \*

On the job, in the shop and in the office . . . all through your operation, this service saves valuable time! See your Socony-Vacuum Representative today for full details.

**SOCONY-VACUUM OIL COMPANY, INC., and Affiliates: Magnolia Petroleum Company, General Petroleum Corporation**



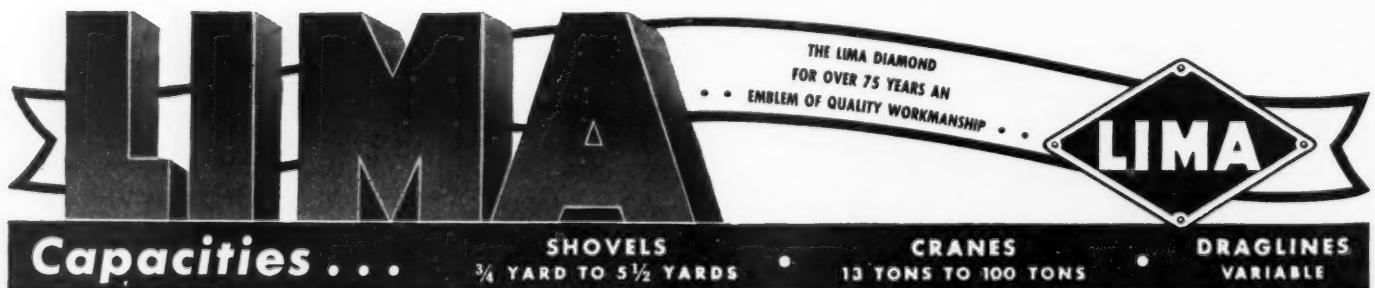


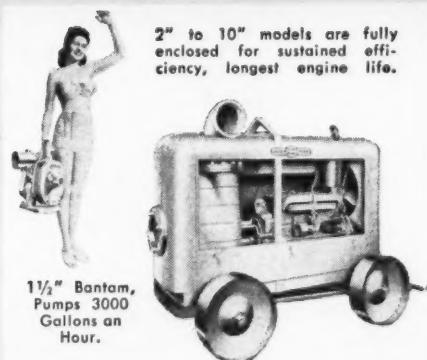
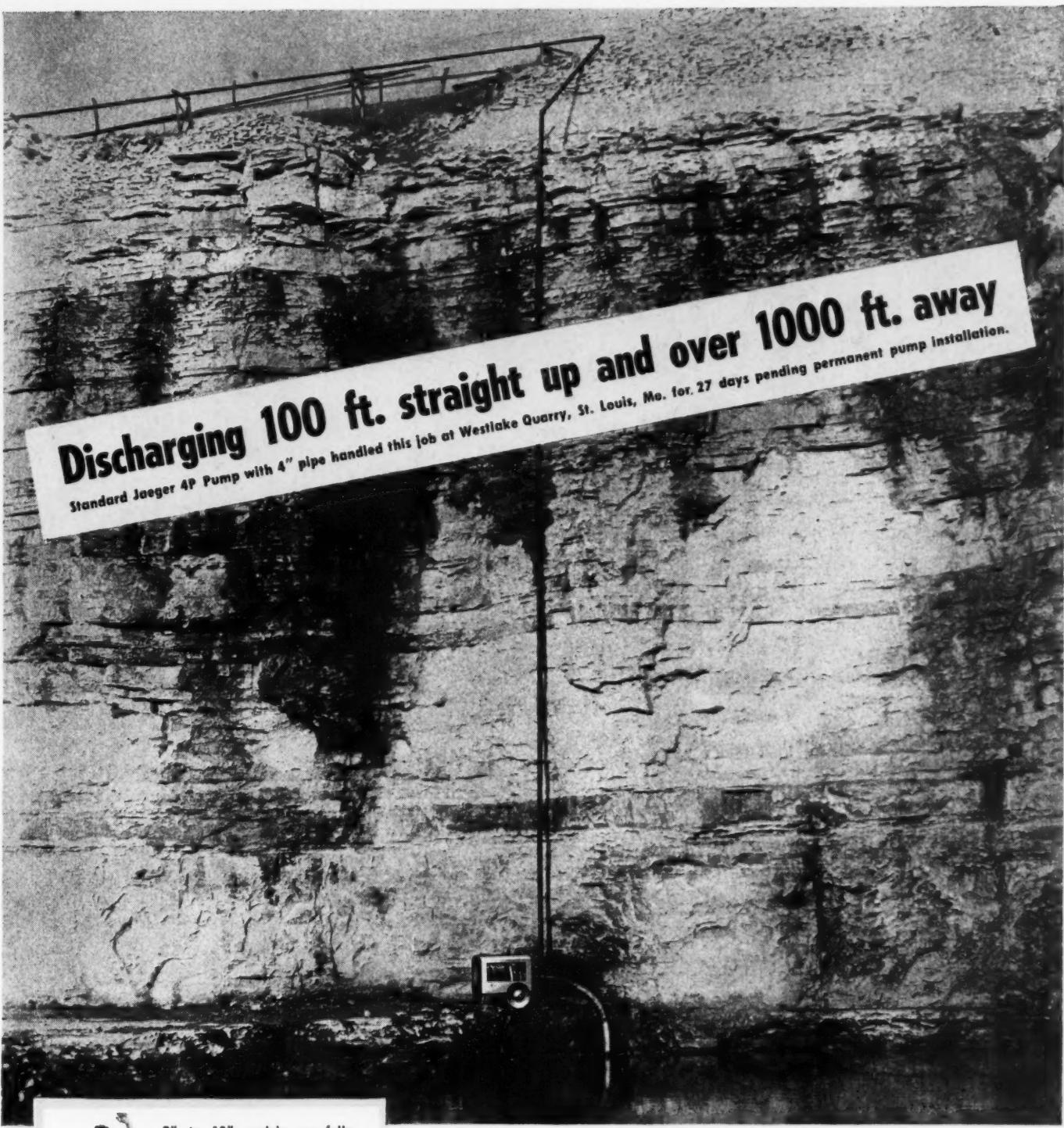
Most dragline work requires the spoil be cast as far back from the cut as possible. Long Booms for such a purpose mean only extra weight if the dragline isn't capable of handling a long boom and load at a low angle. Working range does not depend so much on the length of the boom as it does on the angle at which the boom can be worked without tipping the machine. The accompanying sketch illustrates a comparison in working radii of a well balanced LIMA dragline equipped

with an 80 foot boom and a 3 cubic yard bucket, working at 30 degree angle and a light weight machine equipped with the same length boom and bucket capacity, but which must be worked at 45 degree angle to avoid tipping. LIMA draglines are designed and built for dragline work. Low center of gravity, proper balance, long wide crawlers and big drums, all important advantages for successful dragline operation. Get the facts when you buy your next dragline.

## LIMA LOCOMOTIVE WORKS, INCORPORATED

Shovel and Crane Division . . . LIMA, OHIO  
OFFICES IN PRINCIPAL CITIES



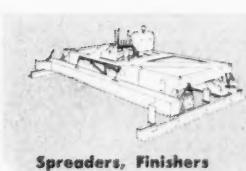


2" to 10" models are fully enclosed for sustained efficiency, longest engine life.

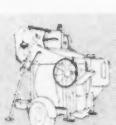
A standard Jaeger 4" Pump was able to handle this job (after two other well-known pumps had tried and failed) because Jaeger "Sure Primes" are built and powered beyond their guaranteed performance. That's why contractors buy more Jaeger Pumps than any other make — and get more for their money in doubly-sure and faster priming, high efficiency and long-life, low-cost service under the toughest job conditions.

**THE JAEGER MACHINE CO., COLUMBUS 16, OHIO.**

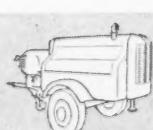
REGIONAL OFFICES: 8 E. 48th St. 226 N. La Salle St. 235-38 Martin Bldg.  
NEW YORK 17, N. Y. CHICAGO 1, ILL. BIRMINGHAM 1, ALA.



Spreaders, Finishers



Concrete Mixers



Compressors

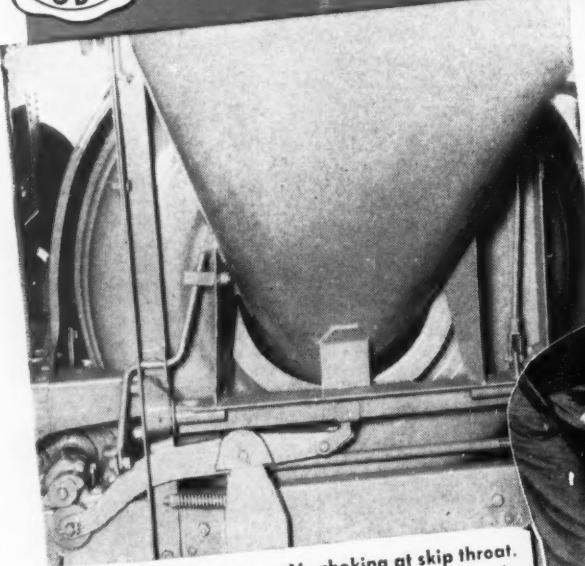
**JAEGER**  
*Engineered EQUIPMENT*

Truck Mixers • Hoists • Concrete and Bituminous Paving Equipment

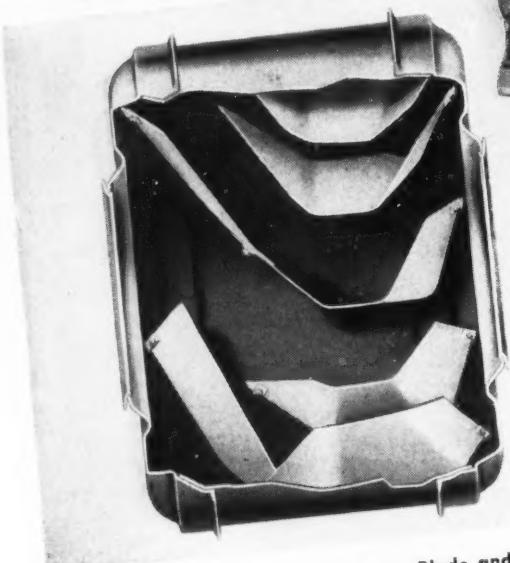
# DANDIE-MIXED Concrete is high quality concrete



Kwik-Mix Dandie Concrete  
Mixers come in 4 sizes:  
16-S, 11-S, 6-S and 3½-S.



Faster charging. No choking at skip throat.  
Dandie Selective Skip Shaker shakes only  
when skip is ready for shaking, not before.



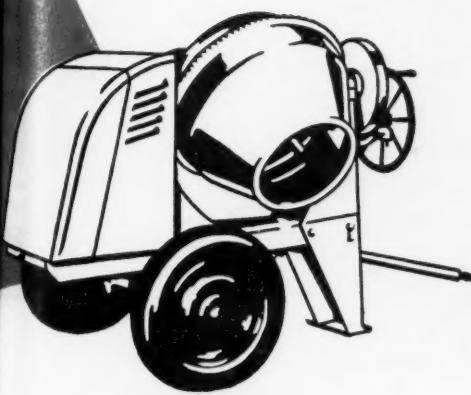
Fully-mixed concrete every batch. Blade and bucket  
combination inside Dandie Drum completely cement-  
coats every bit of the aggregate.



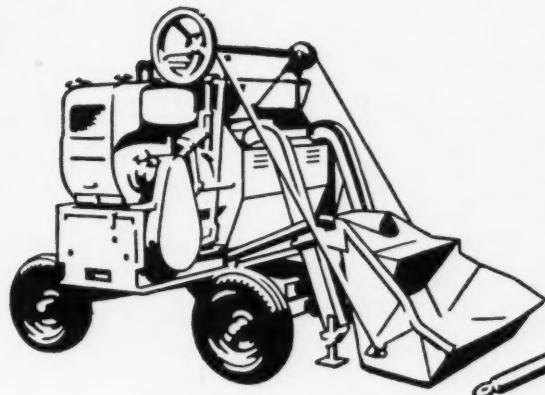
Tilted Flow-Line Discharge Chute, also exclusive  
on the Dandie Mixers, empties drum faster, com-  
pletely. Natural flow-line of concrete inside drum  
is continued when discharging.

## K W I K - M I X C O M P A N Y

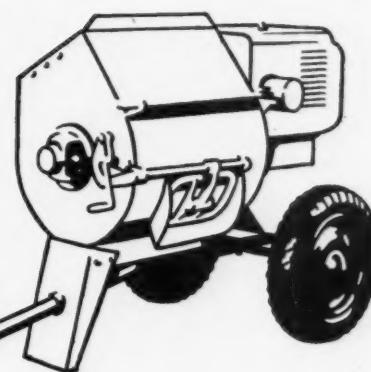
KOEHRING SUBSIDIARY • PORT WASHINGTON, WISCONSIN



Kwik-Mix Dandie concrete mixers in the 3½-S size come in three types: side discharge filter, end discharge filter, and end discharge non-filter.

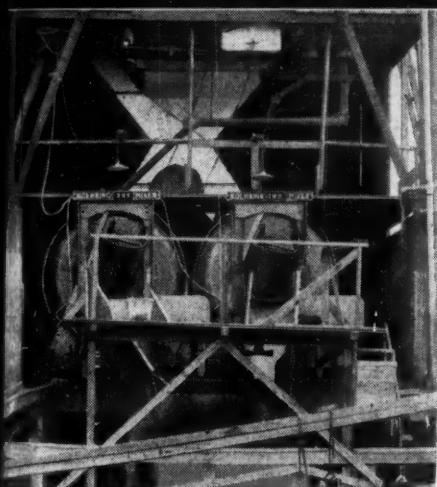


Kwik-Mix Bituminous Non-Tilting mixers cut patching time. End discharge makes possible direct pouring into break. 14, 10 cubic foot sizes.



Kwik-Mix 6-P Plaster-Mortar Mixer does away with back-breaking tilting. Big discharge door, easily opened, discharges batch in 7 seconds.

## KOEHRING 1-yd., 2-yd., 3-yd. CONCRETE MIXERS

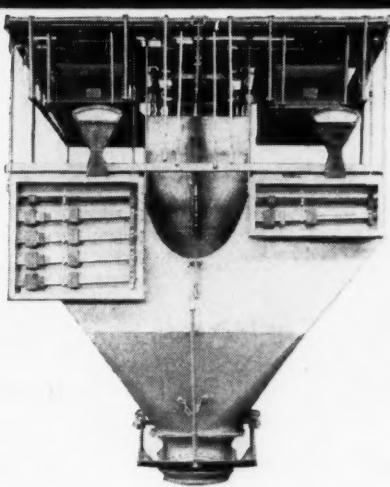


### Heavy-Duty Mixers for Central Mix Plants

Big brothers of the Kwik-Mix Dandie line, Koehring Heavy-Duty Construction Mixers are built for long, tough service and high production standards. Gears fully enclosed. Main frame all-welded. Flow-line discharge chute power-operated.

**KOEHRING**  
COMPANY  
MILWAUKEE 10, WISCONSIN

## JOHNSON Concentric BATCHER



### Fast Batching Cycle . . . Weighs Cement Separately

Assures accurate batching control of cement, sand and aggregate for high quality uniform concrete in central mix plants. Centralized control. Faster batching cycle. Pre-mixes, pre-shrinks all ingredients. Eliminates dusting, gumming.

**C. S. JOHNSON**  
COMPANY  
CHAMPAIGN, ILLINOIS

## PARSONS 200 Wheel TRENCHLINER



### Latest Postwar Design for High Speed Production

Latest addition to the Parsons line. Built for mile-a-day pipeline work, farm and railroad drainage. "Double Pivot" mounting of wheel simplifies fine grading of trench bottom. Improved wheel support. Gears fully enclosed in one gear case.

**PARSONS**  
COMPANY  
NEWTON, IOWA

# New high-speed rubber-tired

## Model C

**Speeds up to 15 m.p.h., forward and REVERSE**  
4 speed selections from 1.67 m.p.h.

**Non-stop, instantaneous speed selection**  
Constant-mesh Tournamatic transmission.

**Easy to operate ... air-actuated controls**  
Finger-tip steering, blade operation . . . single pedal for brakes.

**Tapered-bead tires . . . 14.00x32 or 21.00x25**  
Permit low pressure . . . give ground-gripping traction . . . flotation.

**Big load capacity . . . 11' 2"x43" blade**  
Blade lift 44"; drop, unlimited; cable controlled; fast-acting.

**180 h.p. Diesel . . . weight 14½ tons**  
Other sizes of TOURNADOZERS will follow soon.



*Pusher loading*

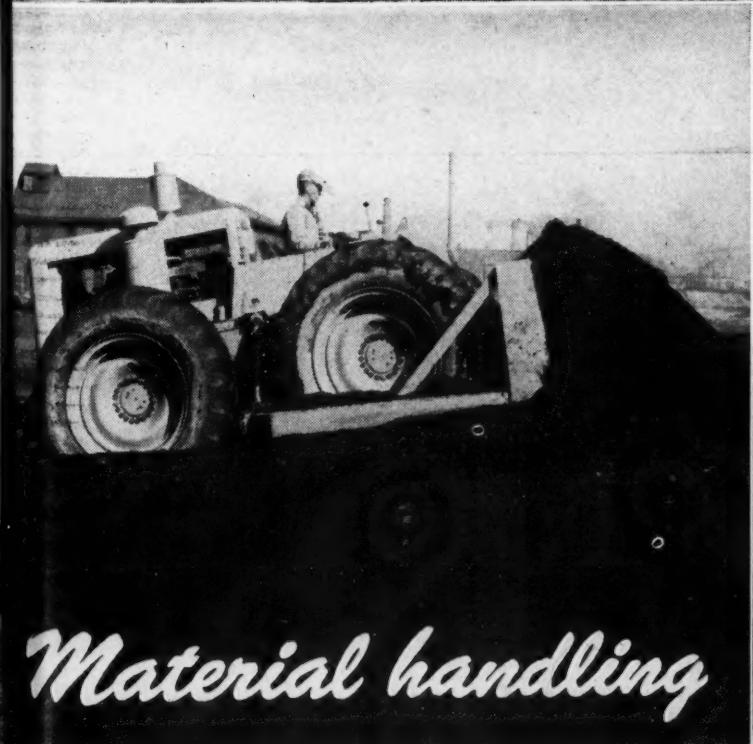


**See your Le Tourneau Distributor  
NOW for complete information**

# TOURNADOZER



*Dirtmoving*



*Material handling*



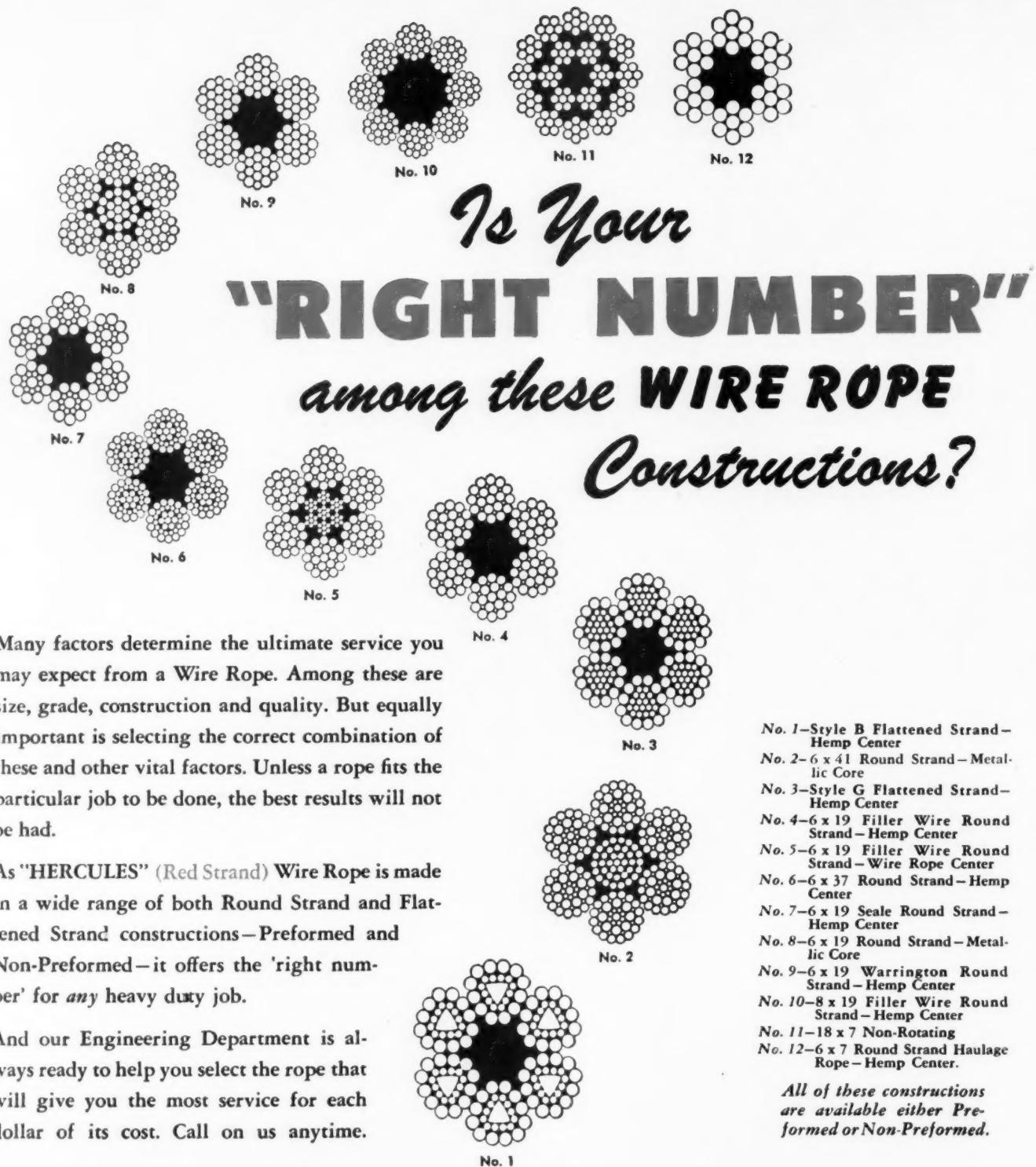
*Clearing*

**LE TOURNEAU**  
PEORIA, ILLINOIS



# TOURNADOZERS

TOURNADOZER, TOURNAMATIC—Trade Mark C64



# "HERCULES"

REG. U.S. PAT. OFF.

RED-STRAND

WIRE ROPE

MADE ONLY BY

A. LESCHEN & SONS ROPE CO.

ESTABLISHED 1857

5909 KENNERLY AVENUE • ST. LOUIS 12, MISSOURI  
NEW YORK • CHICAGO • DENVER • SAN FRANCISCO • PORTLAND • SEATTLE



**America's Most Complete Line  
of Material Handling Buckets**

**All purpose • SHOVEL  
• PULLSHOVEL  
• DRAGLINE  
• CLAMSHELL**

• FRONTS, BOTTOMS, SCOOPS AND TEETH shown in red on buckets are 14% manganese steel developing tensile strength up to 120,000 p.s.i. This high percentage manganese steel gives tough, rugged teeth for hard service and allows wide set corner teeth for easy entrance in digging. Volume production methods enable us to build a better bucket with amazing economies in manufacturing.

On the  $\frac{1}{2}$  yd. and  $\frac{3}{4}$  yd. Shovel and Pullshovel Buckets, all teeth are interchangeable — a great advantage to operators.



*Experience Counts*

See your shovel man or equipment dealer about PMCO Buckets and Dippers.

**Clamshell**  
Sizes  $\frac{3}{8}$ ,  $\frac{1}{2}$ ,  $\frac{3}{4}$ , 1,  
 $1\frac{1}{2}$ , 2 yds.



**Pullshovel  
Outside Cutter  
Widths**  
26" — 31" — 36" —  
39"

**Dragline**  
All Purpose Sizes  $\frac{3}{8}$  to 2 yds.  
Stripping sizes 2 to 9 yds.



**Shovel**  
Sizes  $\frac{3}{8}$  to 18 yds.

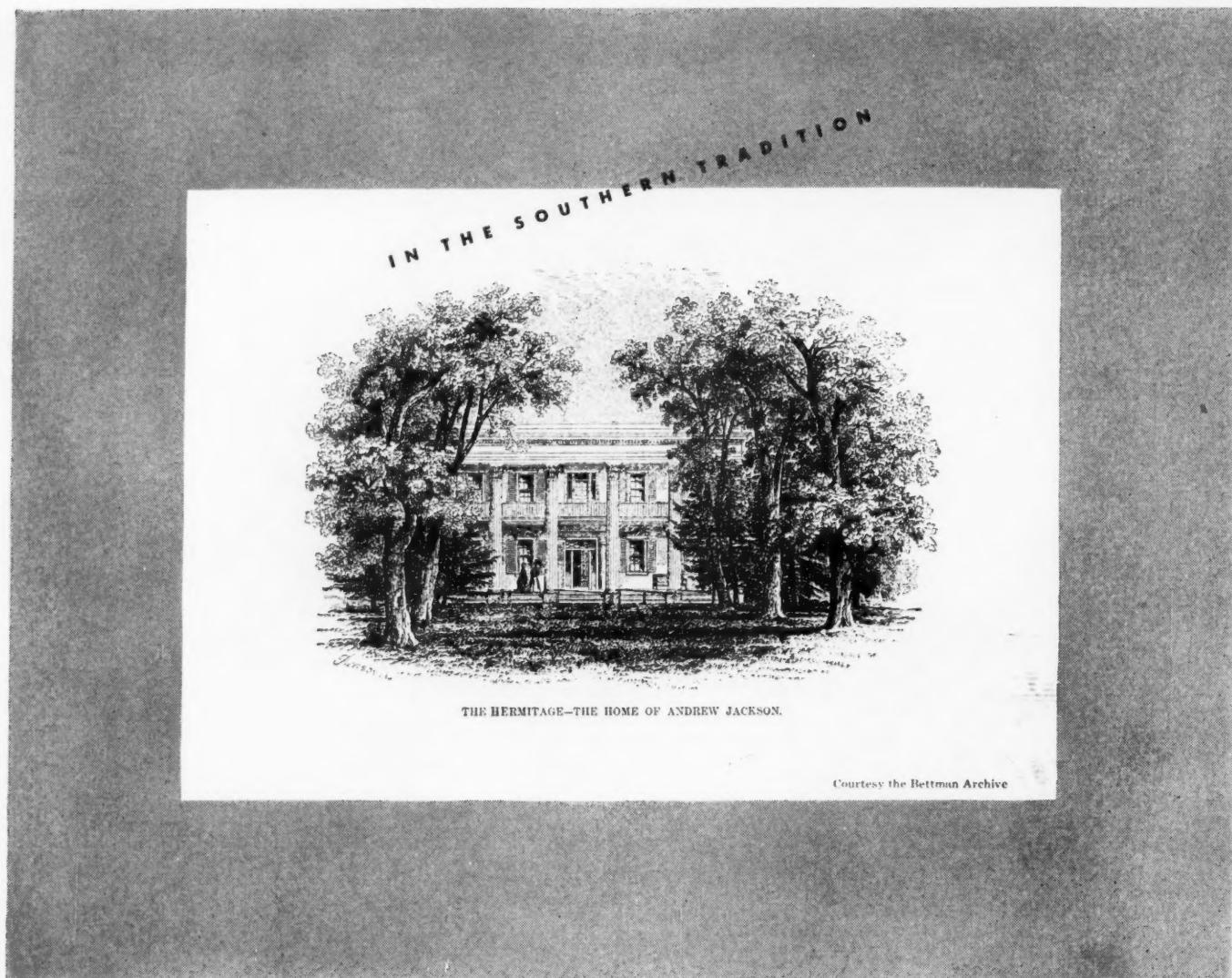
"Quality Since 1880"

**PETTIBONE MULLIKEN CORP.**

WE OPERATE THE LARGEST AND MOST COMPLETE MANGANESE STEEL FOUNDRY IN THE UNITED STATES.

CHICAGO 51,  
U. S. A.





THE Hermitage representative who calls on you is solidly backed by one of the outstanding manufacturing firms in the South.

Not only does he make available a complete line of cements that are unsurpassed in quality; he also brings you

the same swift, efficient, friendly service that has earned this company its high reputation.

Call in the Hermitage man next time you have a problem relating to the use of cement. Helping solve such problems is the most important part of his job.

### **Hermitage Portland Cement Company**

AMERICAN TRUST BUILDING • NASHVILLE 3, TENNESSEE

PORLTAND - HIGH EARLY STRENGTH - AIR ENTRAINING - MASONRY



*Sure*

...THERE'S A DIFFERENCE  
IN WIRE ROPE—



THAT'S WHY  
*The BIG Demand  
is for Tiger Brand!*

• You know you've got an *extra good line* the minute you rig up with U·S·S American TIGER BRAND Excellay Wire Rope. It's easy to handle. And, it has the *stamina* to stand up *tirelessly* under the most gruelling work. It's this ability to "take it" . . . and keep on *taking it*, that makes TIGER BRAND the most efficient, most economical line you can use. Put this better wire rope on your equipment and see for yourself why the BIG DEMAND IS FOR TIGER BRAND.

**AMERICAN STEEL & WIRE COMPANY**

*Cleveland, Chicago and New York*

**COLUMBIA STEEL COMPANY**

*San Francisco*

Tennessee Coal, Iron & Railroad Company, Birmingham,  
*Southern Distributors*

United States Steel Export Company, New York

**UNITED STATES STEEL**

**IMMEDIATE  
DELIVERY**

**ANY QUANTITY  
ALL TYPES AND SIZES**





# FIRST CHOICE OF *Veteran* DRIVERS



GMC trucks are preferred by veteran drivers . . . old and young. They are the choice of men who have operated commercial vehicles for years, just as they are the choice of veteran G.I.s who put GMC military vehicles through unbelievably tough hauling assignments on battlefronts all over the world. GMCs are favorites of these men who know trucks because GMCs can be counted upon to perform powerfully, economically and dependably . . . mile after mile, day after day. They are favorites because they are all-truck built, with truck axles, transmissions, clutches, frames and brakes, plus engines of the same basic design as that used in nearly 600,000 "Army Workhorse" GMCs. There's a model ideally suited to your job . . . to every hauling job, large or small. If you want a truck that can take it, take a tip from veteran drivers. Choose a rugged, war-proved GMC!

**THE TRUCK OF VALUE**

**GASOLINE-DIESEL**

**½ TO 20 TONS**

**GMC**  
**TRUCKS**

GMC TRUCK & COACH DIVISION • GENERAL MOTORS CORPORATION • PONTIAC, MICHIGAN

# Seeing is believing

... watch reliable  
**Le-Roi-Cleveland  
Sinkers at work**

— actually see why their  
surprising speed reduces  
rock-drilling costs



Even the workmen on the job find it difficult not to watch Le Roi-Cleveland Sinkers go to town. The amazing way these drills eat hungrily into the hardest kind of rock must be seen to be believed.

Speed isn't the only advantage in using Le Roi-Cleveland Sinkers. Drill runners like them — they say these tools are easy to hold. Contractors, mining men, and quarry operators find that this feature enables drill runners to put down more feet of hole per shift with less effort—less fatigue. Here are a few additional design details that mean lower drilling costs for Le Roi-Cleveland users:

#### Efficient, long-life valve

— the patented Le Roi-Cleveland valve meters the air so effectively that you get more work out of your air compressor. End seating, this valve actually improves with use.

#### Dynamic, fighting rotation

— the sturdy 4-pawl rifle bar and unique arrangement of parts keep the bit turning in the toughest going. Less time is lost because of stuck steel so that over-all drilled footage is considerably greater.

#### Thorough, positive lubrication

— the highly efficient lubrication system devised for Le Roi-Cleveland Sinkers thoroughly bathes all working parts with a protective coating of oil. Part life is increased many shifts.

Le Roi-Cleveland's line is complete. In addition to the widely used, fast-drilling 45-lb. class H-10 and 55-lb. H-111, there are other sinkers ranging in size from 32 to 83 lbs. Let your Le Roi distributor help you select the right machine for your job.

Write for latest literature. \*Reg. U. S. Pat. Off.



Le Roi  
105 Tractair\*



Le Roi  
Heavy-duty engine



Le Roi  
Engine-generator set



Le Roi  
Airmaster®

## LE ROI COMPANY



CLEVELAND DIVISION  
Manufacturers of Cleveland Rock Drills

Cleveland 11, Ohio

LE ROI COMPANY, General Offices, Milwaukee 14, Wisconsin

NEW YORK • WASHINGTON • CLEVELAND • MILWAUKEE  
BIRMINGHAM • TULSA • BUTTE • SAN FRANCISCO

# BUILT FOR BIG LEAGUE

## *digging*



### THEW LORAIN 820 FEATURES

Hydraulic clutch prevents engine stalling under any digging circumstances—cushions and absorbs digging shocks and impacts—saving machinery and cable.

Turntable Center Drive Design permits full concentration of power on any one operation—or proper distribution of power over 2 or 3 simultaneous operations.

Two-piece swing drums on roller bearings

Extra wide crawler track mounted on anti-friction bearings

2-speed chain drive crawler

Plenty of crawler length (15' 6") width and weight

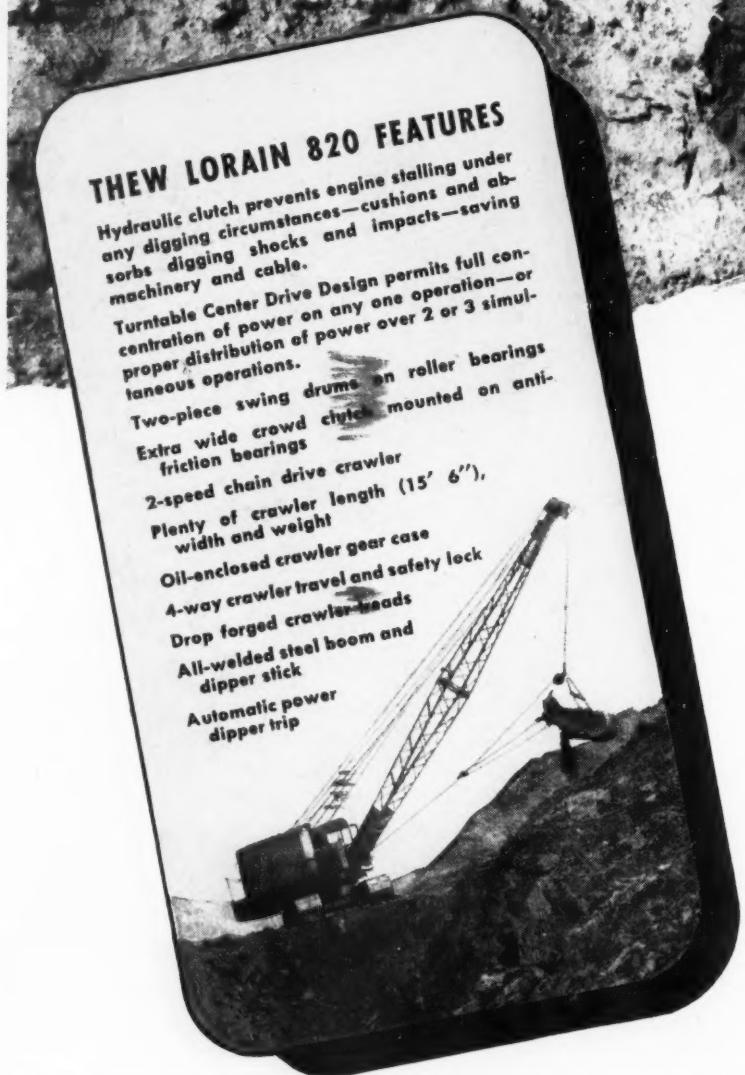
Oil-enclosed crawler gear case

4-way crawler travel and safety lock

Drop forged crawler tracks

All-welded steel boom and dipper stick

Automatic power dipper trip



WHETHER it's a major, big yardage contract or a short stretch of murderous rock digging, the Lorain-820 is the consistent choice of experienced contractors. Every component of this 2-yd. machine—crawler, turntable, shovel boom—is designed not only for strength but to utilize its great power wisely and well. The result—a fast digging, nimble moving, heavy-duty machine that will work with the same zing and zest on the final stages of a difficult job as it did at the start.

If you have work ahead that calls for big league shovel or crane performance from start to finish, you'll want all the facts about the Lorain-820. Your local Thew-Lorain distributor has them ready and waiting for you.

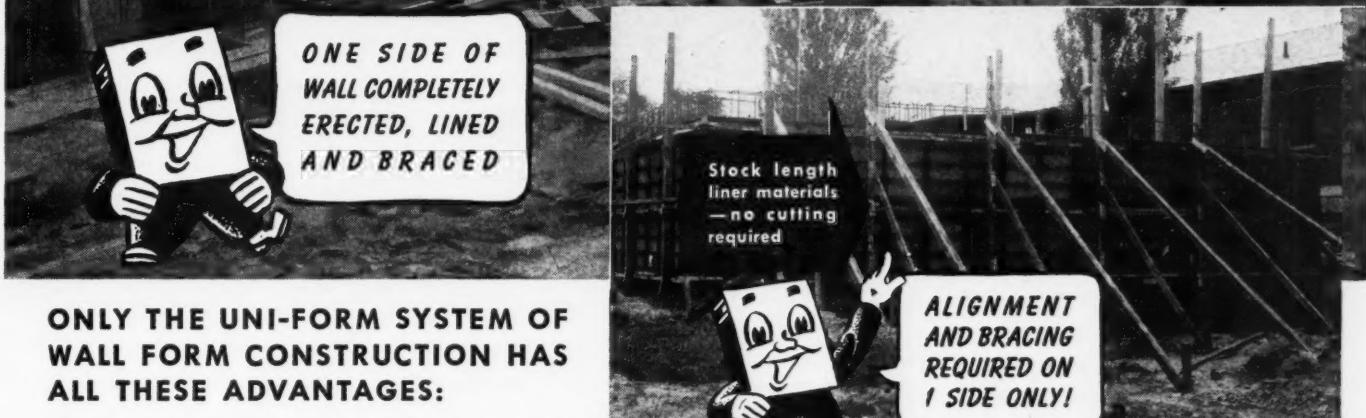
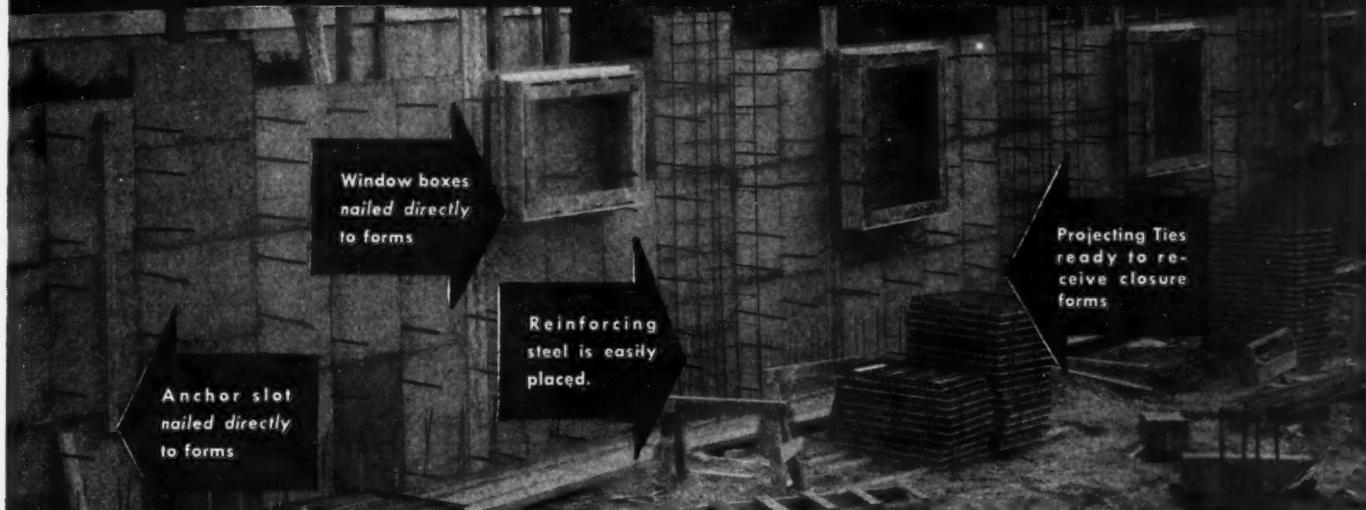
**THE THEW SHOVEL COMPANY**  
LORAIN, OHIO

*Thew* Reg. Trade Mark  
**Lorain**

**820**

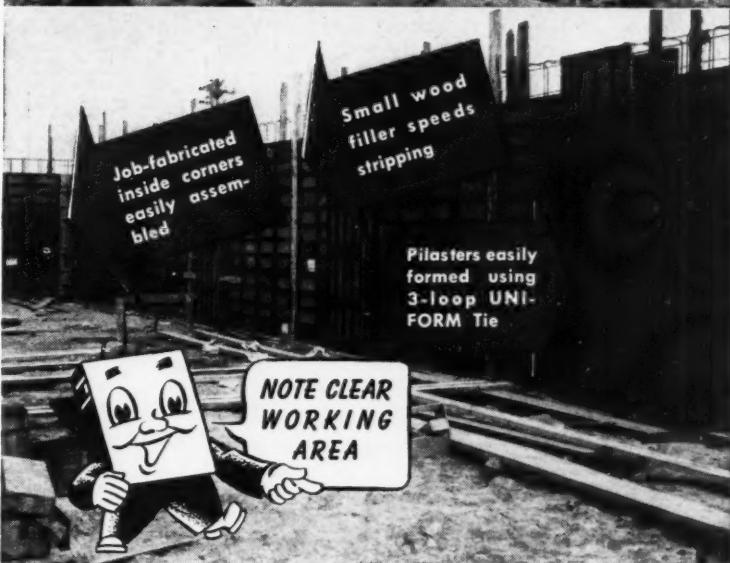
# ARE YOUR FORM COSTS HIGH?

## Save... with UNI-FORMS



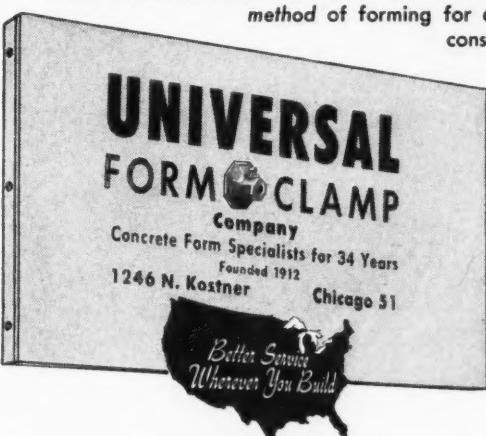
### ONLY THE UNI-FORM SYSTEM OF WALL FORM CONSTRUCTION HAS ALL THESE ADVANTAGES:

- Structural strength of a steel form PLUS a much desired nailing surface.
- Faster erection—easier stripping—because UNI-FORM Ties quickly and easily tie and lock UNI-FORMS into a tight, rigid form.
- Requires one side alignment and bracing—saves 25 to 50% time, material and money.
- One side of the form is erected—box-outs, window boxes, conduit, ducts, etc., nailed directly to the panels.
- Special forming requirements—brick ledges, pilasters, offsets, etc., are quickly and easily handled without "special" materials.
- The lowest material and labor cost of any other method of forming for concrete construction.



The UNI-FORM System of Wall Form Construction  
is saving building time and costs on  
every type of concrete construction:

HOUSING • SCHOOLS • HOSPITALS • FACTORIES  
THEATRES • STADIA • SEWER & WATER SYSTEMS  
TREATMENT AND DISPOSAL PLANTS



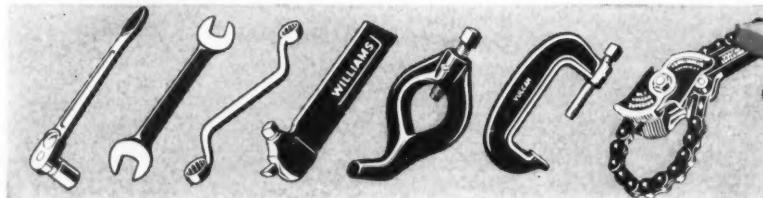
**Concrete Forms • Form Ties • Brick Ties • Reinforcing Steel Supports and Building Specialties**



## Big, Tough Jobs

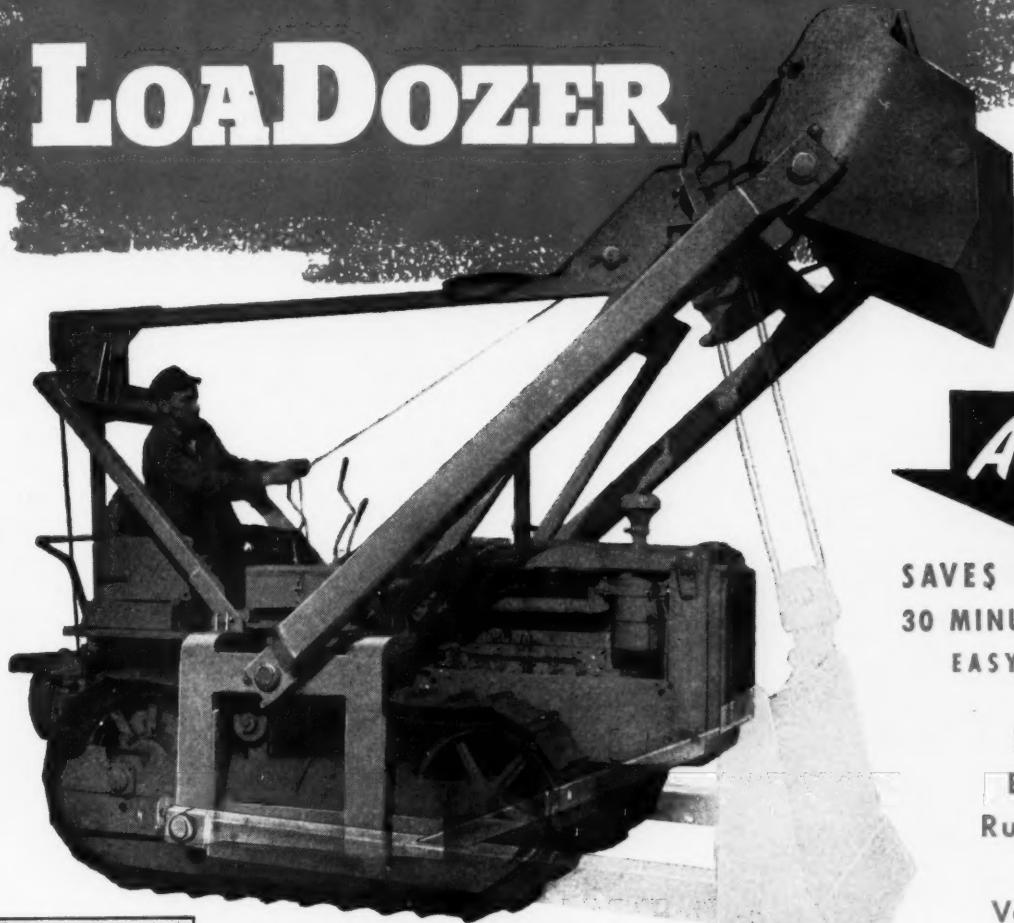
### WILLIAMS "SUPERECTOR"

● This rugged, reversible ratchet wrench is designed for speed and power. Quadruple pawls, rather than a single pawl, combine with a drop-forged handle to give it unbelievable strength. Twenty teeth on all sockets—both hex and square—permit complete rotation of nuts with only 18° handle swing. Made in five brawny sizes up to 53" long, accommodating sockets with openings from 1" to 4<sup>5</sup>/<sub>8</sub>". Sold by Industrial Distributors everywhere. J. H. Williams & Co., Buffalo 7, N. Y.



DROP-FORGINGS AND  
DROP-FORGED TOOLS

# NOW—THE SOUTHWEST LOADOZER



All this

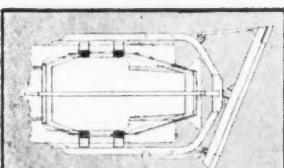
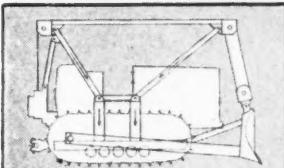
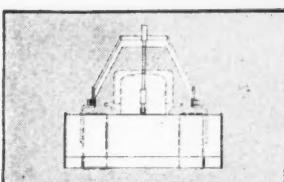
SAVES ONE TRACTOR  
30 MINUTE CHANGE-OVER  
EASY OPERATION

Balance  
Economy  
Ruggedness  
Speed  
Versatility

ANOTHER EXAMPLE  
OF *Southwest's* LEADERSHIP

All these features are "built-in" qualities of the new SOUTHWEST "LOADOZER"—Extra values that mean greater efficiency and economy in Loader and Bulldozer operations. Remember—you SAVE ONE TRACTOR—it takes only 30 MINUTES TO CHANGE OVER this combination Loader-Bulldozer unit.

- Built for all four makes of track type tractors.
- See your equipment dealer about the complete line of SOUTHWEST CONSTRUCTION EQUIPMENT.
- For complete specifications on this Loader-Bulldozer combination unit—WRITE FOR BULLETIN CM-11.



"Over Center Track Mounted" design gives perfect balance

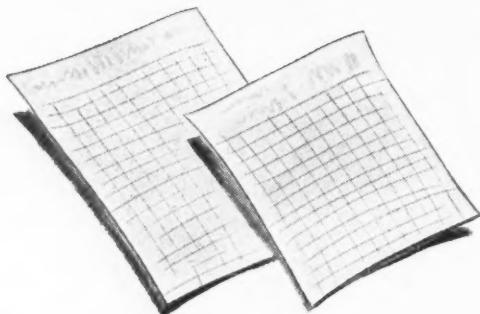
CONSTRUCTION MACHINERY DIVISION

## Southwest Welding & Manufacturing Co.

ALHAMBRA, CALIFORNIA

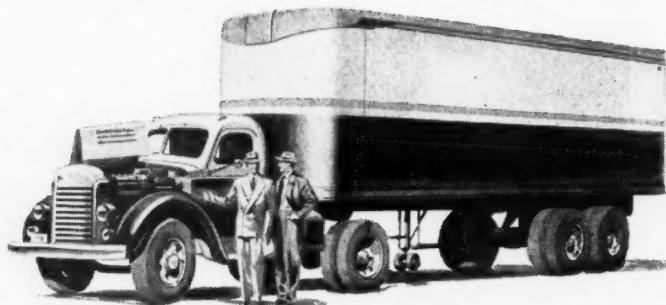
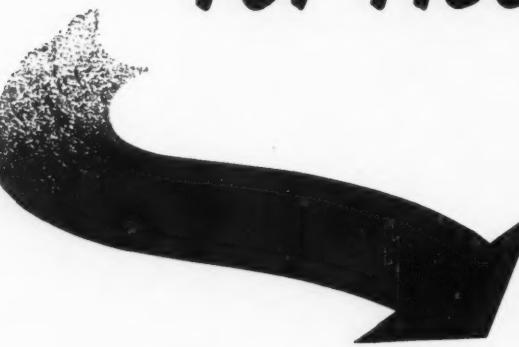


# Here's a complete service for fleet operators



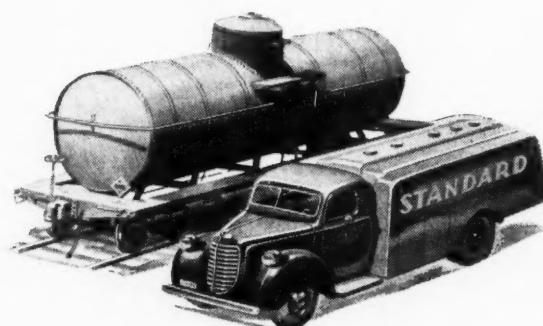
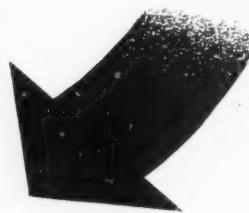
## Streamlined PM,

a simplified preventive maintenance plan, adaptable to fleets of all types and sizes.



## Competent Automotive Engineers

to help fleet owners get top performance combined with utmost economy from products which Standard Oil supplies.



## Adequate delivery facilities—

over 4000 truck-equipped agents in the Midwest—to make products available when and where they are wanted.

**Outstanding fuels and lubricants** for all fleet requirements. Standard Oil's complete line offers the economies and conveniences of buying all your petroleum requirements from one source. In addition, you are assured of uniform high quality in every product you buy because one responsible organization controls the manufacturing and handling of these products, from the crude oil stage to delivery at your door.

Put this service to work on your fleet. If you are located in the Midwest, just call the nearest Standard Oil Company (Indiana) office—ask to have an Automotive Engineer see you—or write 910 South Michigan Avenue, Chicago 80, Illinois.

**STANDARD OIL COMPANY (INDIANA)**

**STANDARD  
SERVICE**

# TRUCKERS TELL US:



"Brother—  
they're really  
tough!"

Below the quote is another decorative horizontal border of small squares.



Truckers agree Armstrong's new **Rhino-Flex** Truck Tire—with Rayon Cord—gives longer wear, greater safety—at no extra cost.

Truckers coast to coast are praising Armstrong's new **Rhino-Flex** Truck Tire. They say: "it's tougher" ... "much safer" ... "wears longer" ... "got more guts".

You see, **Rhino-Flex** Armstrong's are made with tougher, tighter twisted rayon cord—that "gives" with impact, snaps back smoothly. They're perfectly balanced for more uniform tread wear. They're engineered specially to run cooler ... mile after mile.

Ask your Armstrong dealer about this new, tougher, super truck tire. See for yourself why truckers everywhere agree: "*they're tougher, safer, longer wearing.*"

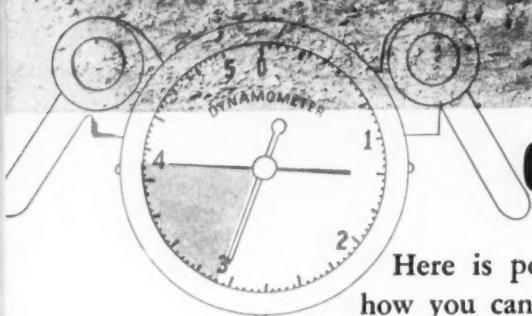


# ARMSTRONG *Rhino*-*Flex* TIRES

Manufacturers of Quality Tires and Tubes Since 1912 • General Offices and Plant—460 Elm Street, West Haven 16, Conn.

Operators know it!

# LaPLANT-CHOATE SCRAPERS



## GAIN AN EXTRA LOAD EVERY FOUR TRIPS

Here is positive proof of how you can reduce loading time and gain extra pay-yardage with modern LaPlant-Choate scrapers. In recent field tests conducted with dynamometers, other leading scrapers required *a full pound of drawbar pull* for every pound of dirt loaded into the scraper bowl—while on the same tests modern LaPlant-Choate scrapers averaged a pound of load with only *3/4 pound of pull*. This LaPlant-Choate saving of 25% in loading naturally means extra yardage at lower cost. And especially on short hauls, it often means *an extra "bonus load" every four trips* — plus added savings in tractor operation and maintenance.

Add to these facts, LPC's job-proved advantages in hauling and spreading and it's easy to see that—*no matter what kind of scrapers you are operating now, you'll be money ahead by replacing them promptly with modern LaPlant-Choate units*. Fortunately, too, you won't have to wait because LPC scrapers in most sizes (from 2 to 14 yards struck measure) are ready for *immediate delivery*. So don't delay. Contact your nearest LPC dealer today and let him show you how you can reduce costs and increase profits with easier loading, faster spreading LaPlant-Choate scrapers. LaPlant-Choate Manufacturing Co., Inc., Cedar Rapids, Iowa; 1022 77th Ave., Oakland, California.

**LaPLANT CHOATE**  
Positive FORCED EJECTION SCRAPERS

FIRST in Value because they're  
FIRST in Performance!

For  
bow  
a st  
point  
In f  
sign  
20%

LES  
The  
to be  
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much  
foun

# Dynamometer tests prove it! LOAD 25% easier!

Less weight per yard of capacity.

Modern, open-top design for easy loading by shovel or dragline.

All working force concentrated at center of gravity for easier, more efficient operation.

Low, wide bowl insures bigger loads with less power.

Bowed offset cutting edge insures better penetration, keeps earth boiling up through center of bowl.

Balanced weight distribution with big tires—completely interchangeable front and rear.

## and Here's Why!



### SUPERIOR DIGGING ABILITY

For sheer digging ability, LaPlant-Cheote's bowed offset cutting edge is as superior to a straight, one-piece edge as a curved, pointed shovel is to a square-nosed shovel. In fact, tests prove that LPC's modern design increases production efficiency up to 20%—by assuring better penetration, better "boiling action", better-balanced loads.



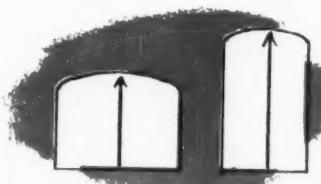
### NO USELESS DEAD WEIGHT

Naturally, the more weight a manufacturer builds into a scraper, the more it costs you to lug around. That's why in LaPlant-Cheote scrapers all useless dead weight has been eliminated so you can use your tractor power to best possible advantage in handling maximum "pay loads".



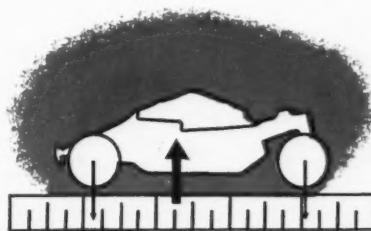
### BETTER ENGINEERING

Low center of gravity and proper location of pivot points in LaPlant-Cheote scrapers mean that you are always pulling (or pushing) in a straight line with the center of the load. Result: greater stability . . . less strain and lost motion . . . more work done with less effort.



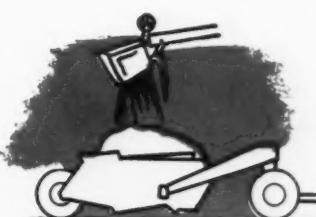
### LESS POWER . . . LESS FRICTION

The shorter the distance a given load has to be raised or slid inside a scraper bowl, the less power or effort it takes—another reason why LPC's low, wide bowl loads so much easier than the high, narrow bowls found on ordinary scrapers.



### BETTER WEIGHT DISTRIBUTION

Regardless of whether the scraper is empty or loaded, the weight distribution in an LPC unit is always uniform—45% on the front wheels, 55% on the rear. There's no shifting of load—no need for special size tires on the rear. LPC tires and wheels are completely interchangeable — for extra efficiency, extra economy!

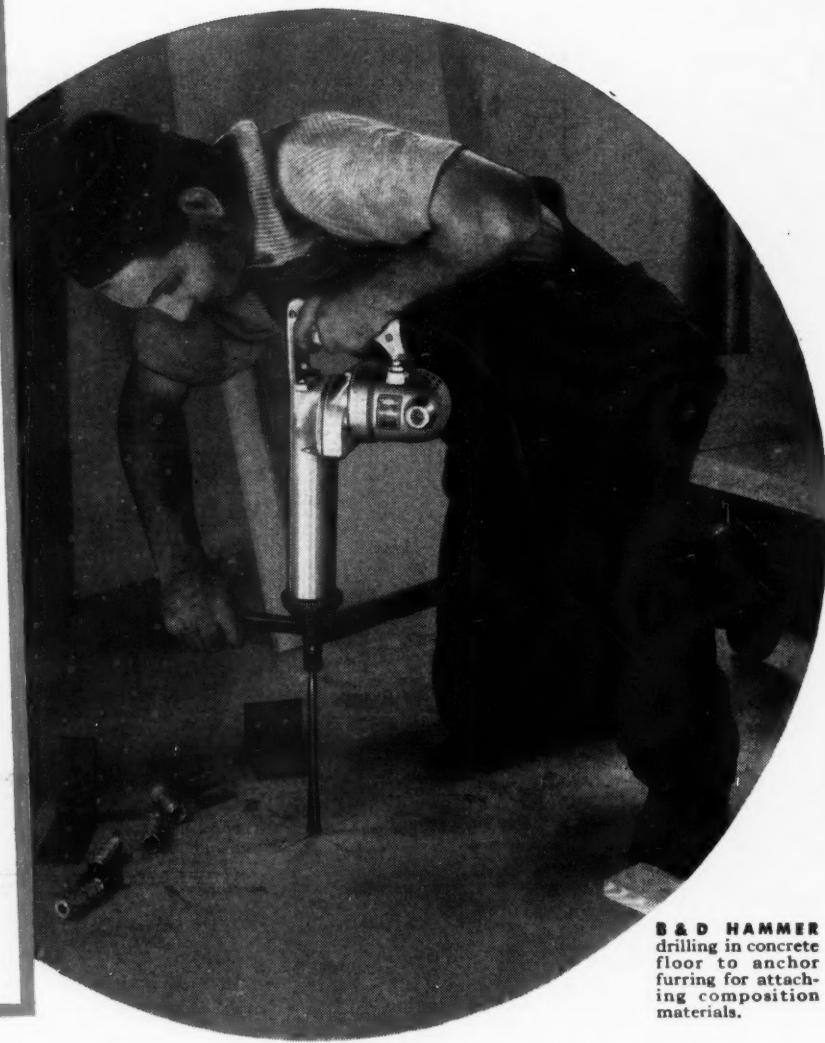


### EXTRA UTILITY ON MANY JOBS

In addition, LPC's modern, open-top bowl has the added advantage of being easily loaded by a shovel or dragline, thus enabling you to use your scrapers for utility hauling and spreading—a real money saver on many jobs.

# Hammers Down Costs on Jobs Like These

- Drill or channel in brick, stone or concrete
- Chip, clean and scale metal
- Gouge, shape and notch timbers
- Handle brute-force demolition
- Drive spikes . . . seam and caulk
- Tamp and vibrate concrete forms
- Scuff concrete surfaces, remove form marks



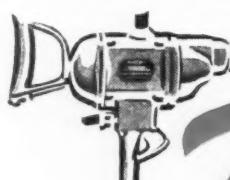
B & D HAMMER  
drilling in concrete  
floor to anchor  
furring for attaching  
composition materials.

THERE are plenty of places where you can use Black & Decker Electric Hammers in construction work . . . to save long hours of hand labor that pile up your costs and slow down your jobs!

High-Speed, hard-hitting and amazingly husky, yet compact and light in weight, these Hammers are completely self-contained. Operate from Standard A.C. or D.C. outlet or portable generator. Require no transformer or extra equipment. Powered by

special Black & Decker-built Universal motors that deliver thousands of sharp, positive hammer blows per minute. And our complete line of Hammer Tools makes them even more useful.

Ask your nearby Black & Decker Distributor for complete information on Hammers and the many other B & D Portable Electric Tools. Write today for our catalog to: The Black & Decker Mfg. Co., 659 Pennsylvania Ave., Towson 4, Maryland.



LEADING DISTRIBUTORS EVERYWHERE SELL

**Black & Decker**  
PORTABLE ELECTRIC TOOLS

LOOK TO

P&H

FOR ADDED VALUES



## HOW GREATER STRENGTH MEANS ADDED PROFITS

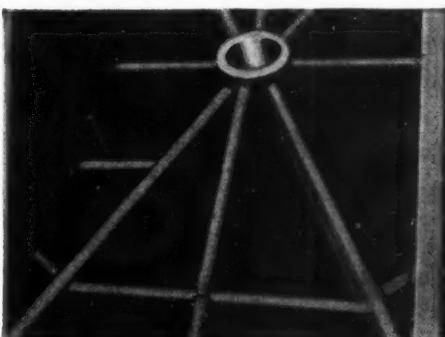
As the originators of all-welded power shovels and cranes, P&H does not limit the advantages of welded construction to a few parts such as booms, etc.

P&H equipment is designed and built — from crawlers to boom point — to gain the full benefits of welded, rolled steel construction. The added rigidity and strength mean better all-around service for years to come.

You'll find a whale of a saving in yardage costs — an upswing in your job profits.



Here's the strongest carbody construction known. Axles are welded integral with turret — and crawler frames with axles. Here's one piece, trouble-free construction.



Here you see the interior web-work of strengthening members in the P&H all-welded revolving frame. Sidestands are welded integral. There are no bolted joints — alignment of machinery is permanent.

**P & H**

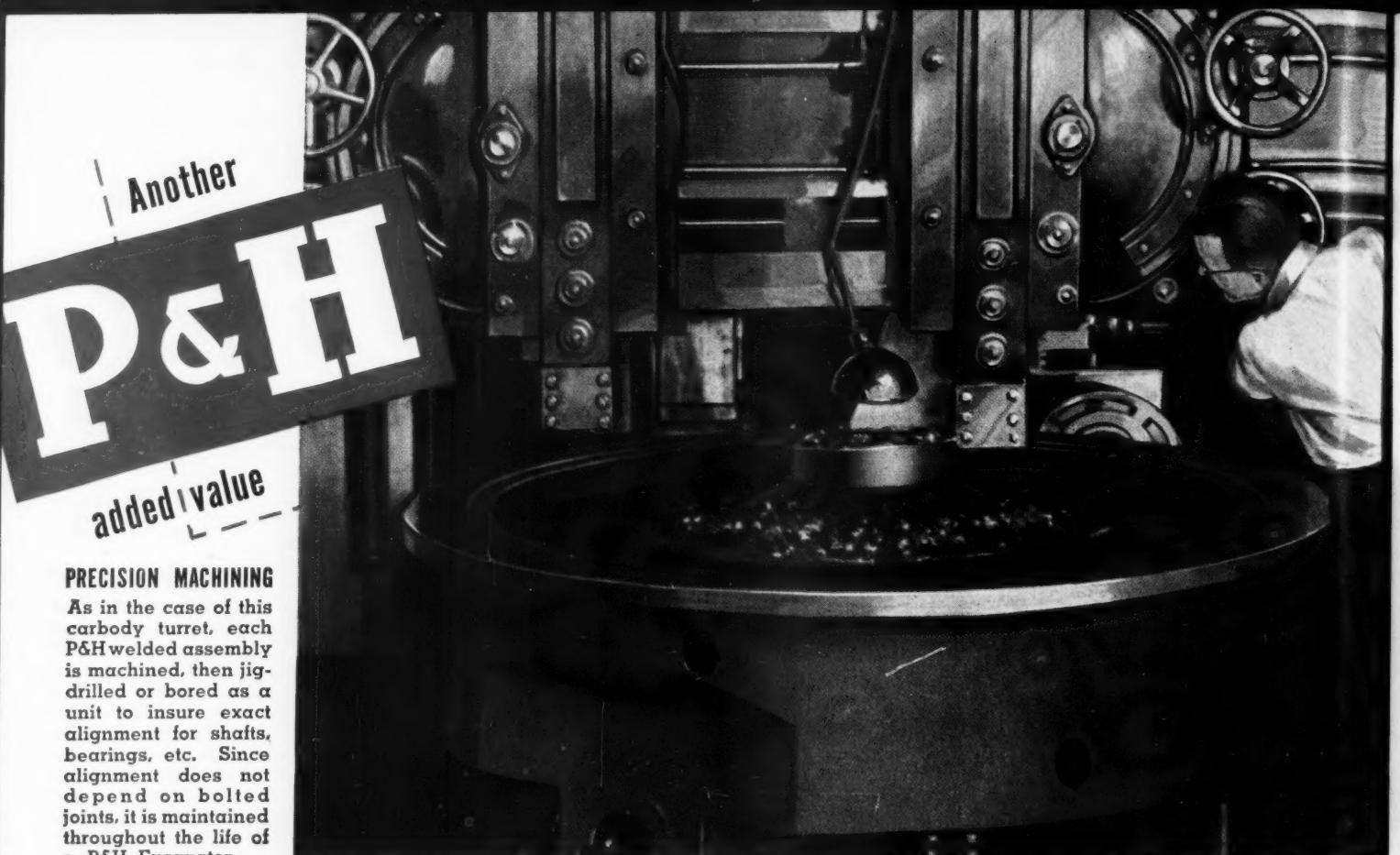
**EXCAVATORS**

(4494 W. National Ave.)  
Milwaukee 14, Wisconsin

**HARNISCHFEGER**  
CORPORATION

EXCAVATORS • ELECTRIC CRANES • ARC WELDERS • HOISTS • WELDING ELECTRODES • MOTORS





Another  
P&H

added value

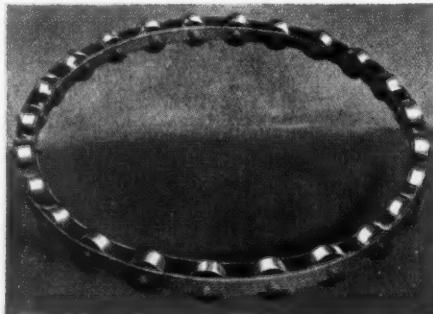
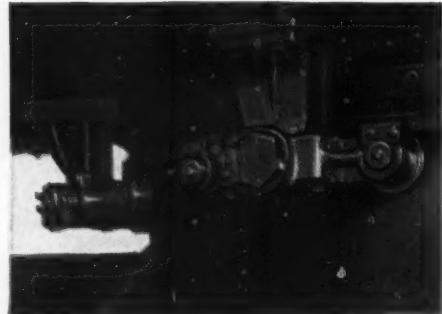
#### PRECISION MACHINING

As in the case of this carbody turret, each P&H welded assembly is machined, then jig-drilled or bored as a unit to insure exact alignment for shafts, bearings, etc. Since alignment does not depend on bolted joints, it is maintained throughout the life of a P&H Excavator.

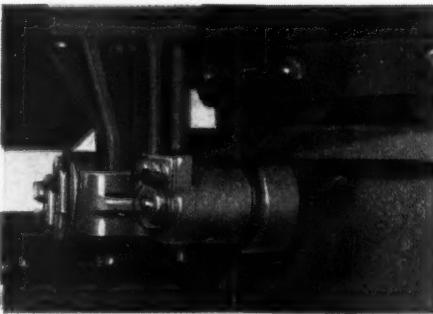
Machining the roller path on a P&H 1½ yd. excavator.

## No rocking horse action between lower and upper

**Hook rollers** eliminate all stresses and strains on center gudgeon by anchoring the revolving deck, or upper, to the carbody. There's no "rocking" of the upper when dipper bites into the bank.



**All weight is carried on rollers.** Since now weight is carried on pins or bushings, a costly source of wear and replacement is eliminated. Another P&H added value that saves you money.



**Live Roller Circle** acts as a huge multiple roller bearing; transmits weight between upper and lower, evenly, over the entire path. There's free movement with a minimum of friction.

P&H's exacting all welded construction is complete — from crawler frames to boom tip — assuring greater strength and rigidity for years to come. Yet this is but one important added value which P&H offers you. Learn about all of them. Call your nearest P&H dealer, or write us.

### HARNISCHFEGER CORPORATION

4494 West National Avenue, Milwaukee 14, Wisconsin

P&H Excavators are built in all sizes up to 6 cubic yards capacity, gasoline, Diesel or electric powered. Ask for literature on the size that interests you.

# VIBROFLOTATION

MODERN METHOD OF SANDY SOIL COMPACTION

EMPLOYS ELECTRIC  
VIBRATOR AND WATER

## This New\* Process

- Increases the load-bearing capacity of soils, and of piles driven into this soil
- Diminishes the void volume and permeability of soils
- Diminishes active soil pressure
- Increases the passive soil resistance

Vibrofotation uses a vertical, cylindrical vibrator† which "sinks" into the earth with the aid of a water jet; compaction being accomplished during withdrawal by the combined action of the water, or another suitable liquid, and the high-speed vibrations which tamp the soil particles. The vibrator is driven by a General Electric totally enclosed motor, specially designed to operate within the vibrator while it is submerged in wet sand.

The same inherent advantages of electric drive which have made possible many construction processes also contributed to the success of vibrofotation. Electricity controls the process, pumps the water, and drives the vibrator by flexible cable throughout the length of its vertical travel.

If you are contemplating electrification of your construction equipment, consult your General Electric representative for first-hand information on recent electrical developments which will help you build a more economical, safer construction tool. *Apparatus Dept., General Electric Co., Schenectady 5, N. Y.*

\* Vibrofotation was introduced in this country recently by Parsons, Brinckerhoff, Hogan and Macdonald, consulting engineers; and Merritt-Chapman and Scott, general contractors.

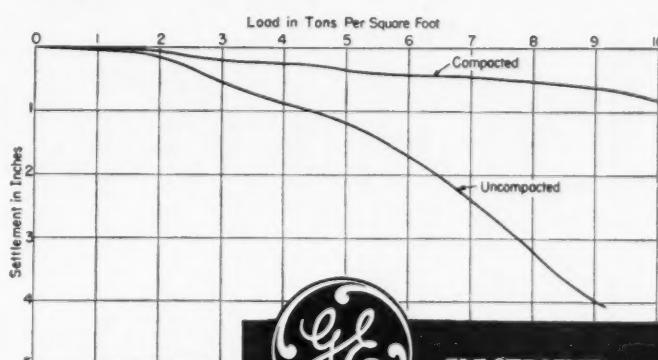
† Built by Baldwin Locomotive Works.



Motor-driven eccentric vibrator (left) is suspended on the crane boom (above) before it enters the soil which is to be compacted.



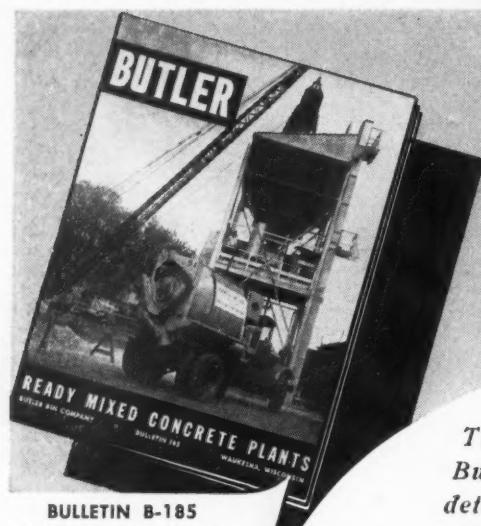
Curves (below) show how vibrofotation increases load-bearing capacity of soils, and reduces settlement.



GENERAL  ELECTRIC

655-58

# TO HELP YOU IN YOUR 1947 Planning!

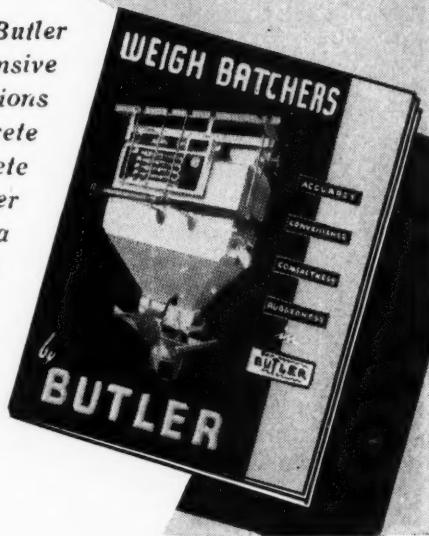


**BULLETIN B-185**  
Butler Ready Mixed,  
Concrete Plants. 24  
pages of illustrations.



**BULLETIN B-260**  
From Central Mixing  
Plants to the ingenious  
Butler Carscoop. 24  
pages of materials  
handling equipment.

These four profusely illustrated Butler Bulletins show in clear, comprehensive detail, Butler engineered installations and equipment in Ready Mixed Concrete Plants, Central Mixing Plants, Concrete Products Plants, Weigh Batchers and other materials handling units. . . . In over a quarter of a century of experience in planning, designing and building such specialized construction equipment, Butler Engineers have encountered and have ingeniously solved many highly unusual problems. These Butler solutions, — illustrated with photographs are shown in these Bulletins. . . . Any one or all of the books are yours for the asking.



**BULLETIN B-150F**  
Completely describing  
and illustrating Butler  
Weigh Batchers. 12  
pages.

NOTE—BULLETINS 150F AND 210C SHOWN AT RIGHT ARE SCHEDULED FOR RELEASE APRIL 15TH, 1947. BECAUSE OF PAPER SHORTAGES, THE EDITION WILL BE LIMITED. PLEASE ENTER YOUR REQUEST NOW.



**BULLETIN B-210C**  
Emphasizing design  
and use of Butler Port-  
able Bulk Cement  
Plants. 16 pages.

**BUTLER BIN COMPANY**  
WAUKESHA, WISCONSIN

Please send me the following free Bulletins:

**BULLETIN B-185**   
**BULLETIN B-260**

**BULLETIN B-150F**  (See note)  
**BULLETIN B-210C**  (See note)

NAME.....  
COMPANY.....  
STREET.....  
CITY..... STATE.....

**BUTLER BIN CO.**

WAUKESHA, WISCONSIN

# *THIS Shouldn't Happen* to a construction job

An overturned salamander . . . a hot rivet . . . or a welder's torch ignites a canvas windbreak and sets off a furious fire. Thousands of dollars of new construction ruined!

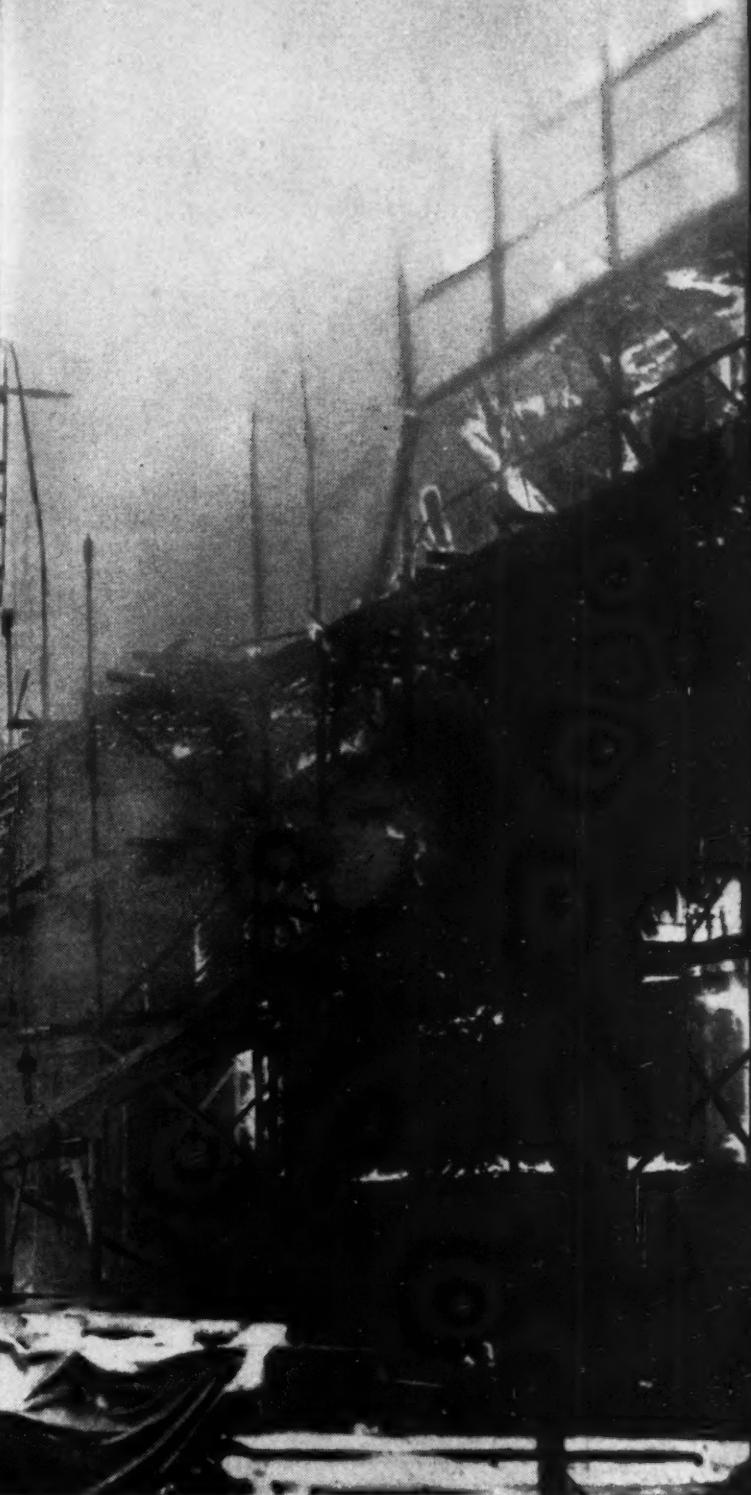
It has happened many times.

But it won't if windbreaks, tarpaulins and other canvas materials used on the job are made of patented FIRE CHIEF Finished Hooperwood Duck. FIRE CHIEF Duck is chemically treated to resist fire. It will not support combustion. It is approved by the Underwriters Laboratories, Inc.

Mildew and sun resistant, too, FIRE CHIEF out-wears untreated canvas many times.

It's cheap fire insurance — and good business — to insist on FIRE CHIEF.

WM. E. HOOPER & SONS CO.  
New York PHILADELPHIA Chicago  
Mills: WOODBERRY, BALTIMORE, MD.



• "Fire-Chief" Finished •

TRADEMARK  
U. S. Patent No. 2,299,612 and other patents

## HOOPERWOOD COTTON DUCK

**It does more, lasts longer, costs less to run...**

*when it's built with*

## **U·S·S HIGH STRENGTH STEELS**

**L**EADING builders of earth moving and construction equipment have proved this a fact. For the past 12 years they have been using U·S·S COR-TEN, U·S·S MAN-TEN and other U·S·S High Strength Steels to increase the capacity, reduce the weight and to add ruggedness and staying power to bulldozers, scrapers, trucks, and other heavy-duty construction equipment that is famous for performance.

With these service-tested, continually improved steels, equipment builders have produced fast-stepping, high-production equipment that just won't lay down on the job no matter how hard you push it. Using these steels they've been able to provide

practically any combination of desirable properties — light weight, great strength, superior toughness, greater resistance to wear, abrasion, shock, impact and fatigue, plus unusually high resistance to atmospheric corrosion.

To help you use these steels most economically, to assure you the best results both in fabrication and service, we can place at your disposal a wealth of practical engineering and fabrication data based on our many years' experience applying U·S·S High Strength Steels for improving digging, loading and hauling equipment of all kinds. Have you a copy of the new U·S·S COR-TEN Catalog?

**AMERICAN STEEL & WIRE COMPANY, Cleveland, Chicago and New York  
CARNEGIE-ILLINOIS STEEL CORPORATION, Pittsburgh and Chicago**

**COLUMBIA STEEL COMPANY, San Francisco**

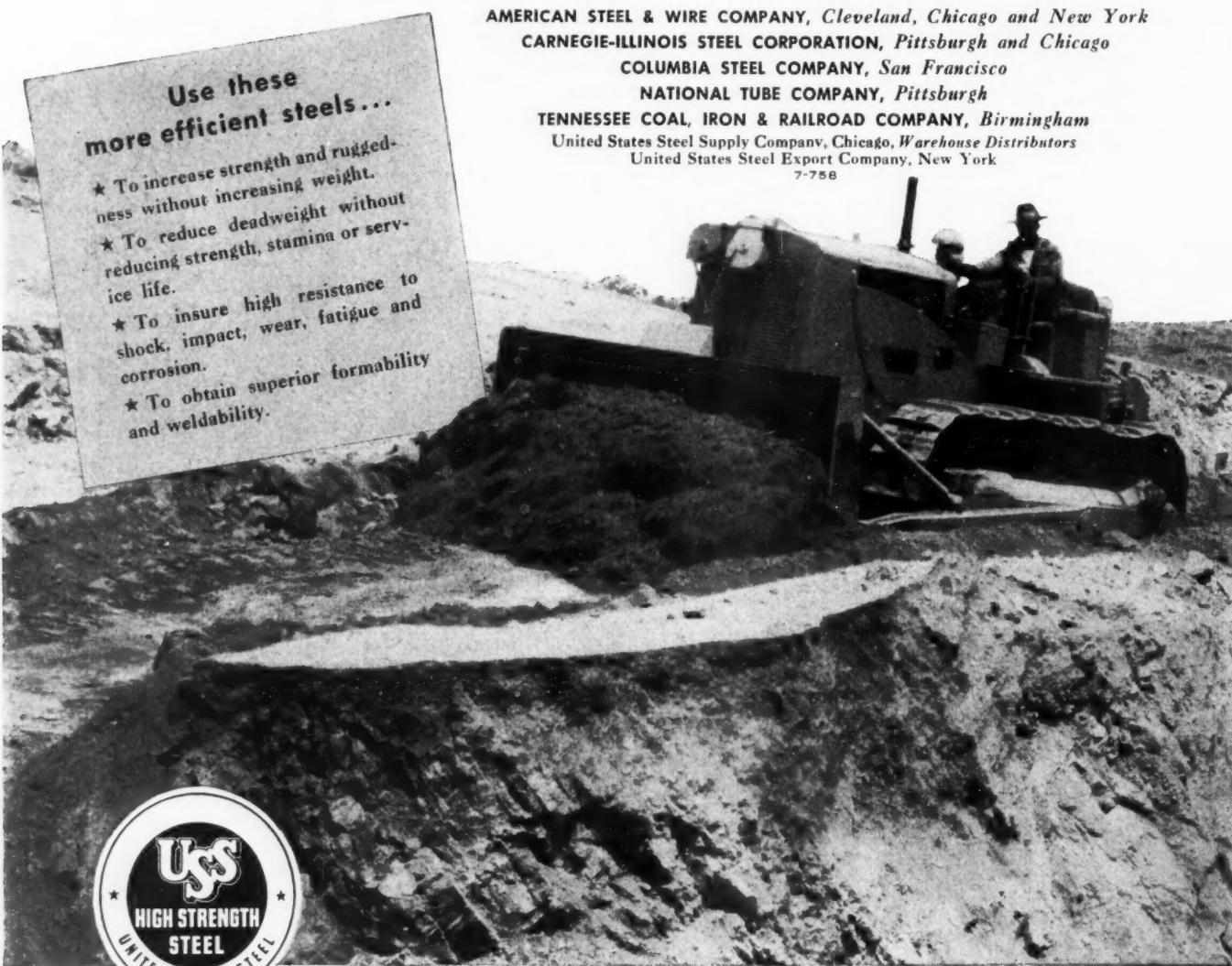
**NATIONAL TUBE COMPANY, Pittsburgh**

**TENNESSEE COAL, IRON & RAILROAD COMPANY, Birmingham**

United States Steel Supply Company, Chicago, Warehouse Distributors

United States Steel Export Company, New York

7-758



# UNITED STATES STEEL



THIS ROAD called for  
one type of surface

THIS STREET called for  
a different type



## TEXACO solved both problems effectively and economically

THE ROAD, located in Massachusetts, had become raveled and unsightly. To give it the smooth, waterproof, skid-resistant mat shown in the photograph, TEXACO RAPID-CURING CUTBACK ASPHALT NO. 5 was applied, covered with stone chips, then broomed and rolled. This inexpensive but serviceable mat gives the old road a new lease on life.

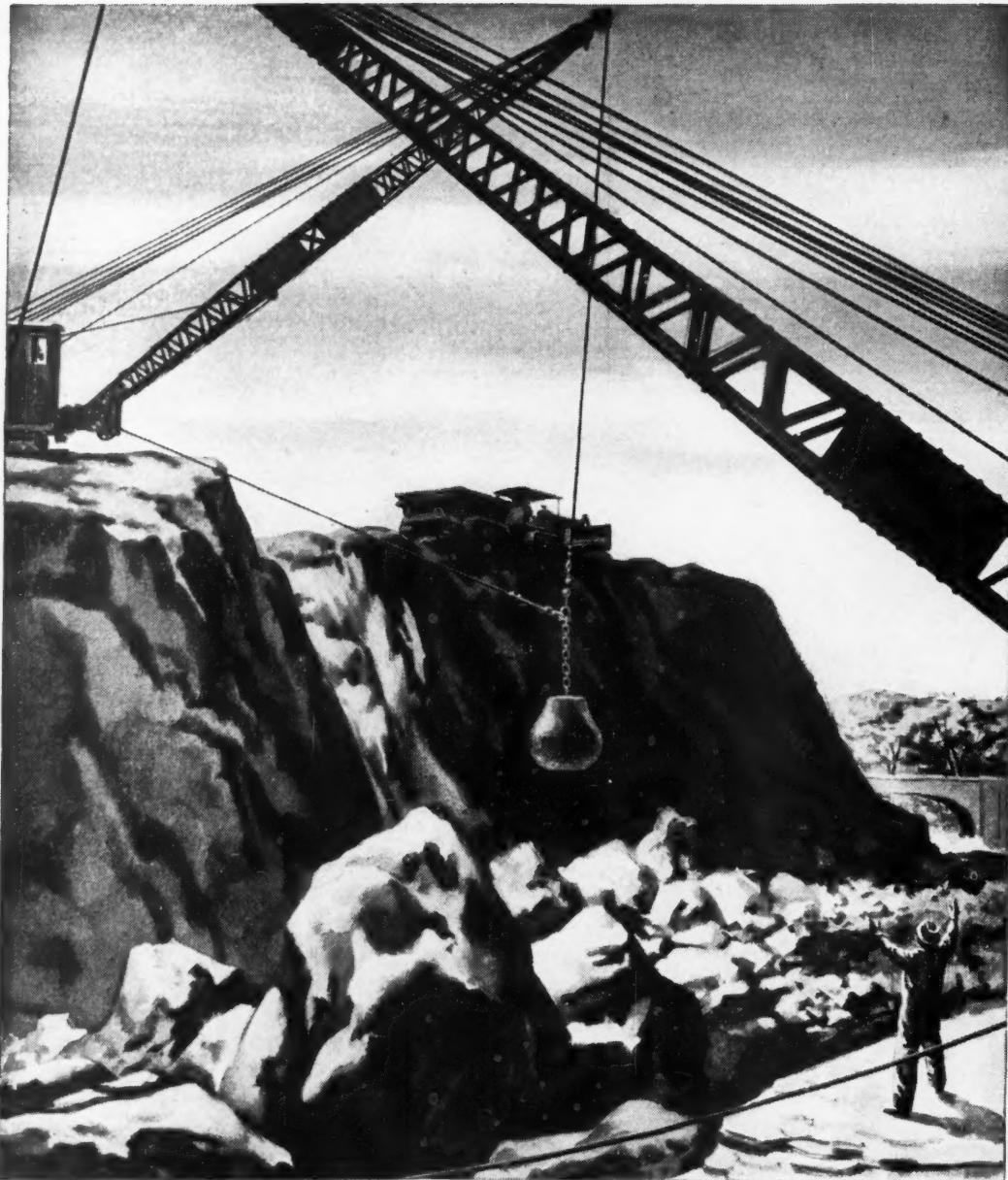
THE STREET, principal thoroughfare of Springfield, Mass., formerly was served by a worn brick pavement, which had outlived its usefulness. This pavement was taken up. A leveling course of asphalt binder was laid on the old base, after which a resilient, heavy-duty TEXACO ASPHALTIC CONCRETE wearing surface was constructed, which is good for many years' service under the hardest wear.

*Texaco Engineers, who are Asphalt specialists, will be glad to discuss your road or street problem with you and recommend the type of Texaco Asphalt surface best suited to your requirements. Write our nearest office.*

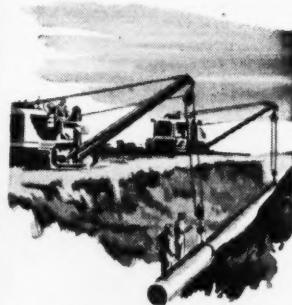
THE TEXAS COMPANY, Asphalt Sales Dept., 135 E. 42nd Street, New York City 17  
Boston 16 Chicago 4 Denver 1 Houston 1 Jacksonville 2 Philadelphia 2 Richmond 19



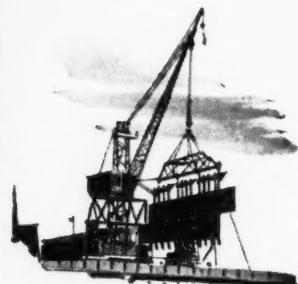
# TEXACO ASPHALT



*You'll see more and more jobs like these as the nation's new highway and airport building program gets under way. Skull-crackers and draglines use a lot of Preformed wire rope to get the material out.*



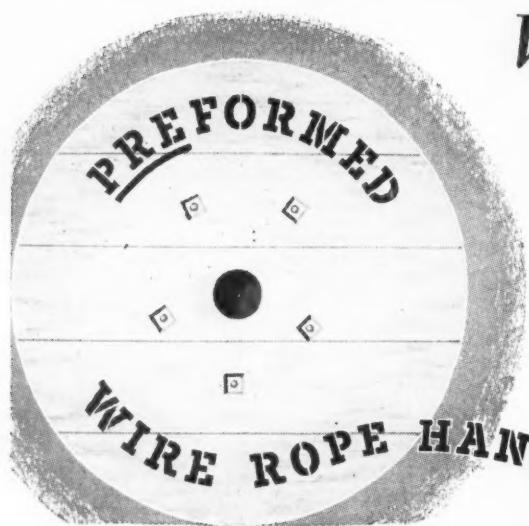
*Laying pipe lines is a fast job today with machines and Preformed wire rope. Improved methods and improved wire rope make the work easier and faster.*



*Do you worry when you see great weights lifted by shipyard cranes? The operators don't, for they know the Preformed wire rope will hold.*

## Here you see Post-War Progress in Action ...

### Wire Rope Makes it Possible



For the busy post-war days ahead, machines are rigged with Preformed wire rope. It lasts longer. It reduces time lost for replacement. It handles easier. It is safer. These operators and the front office agree Preformed is the rope for post-war progress.

ASK YOUR OWN WIRE ROPE MANUFACTURER OR DISTRIBUTOR

*no other paver  
has a crawler  
like this!*

The  
**MULTIFOOTE**  
*Duomix*  
a Double Drum  
34-E Built by Foote

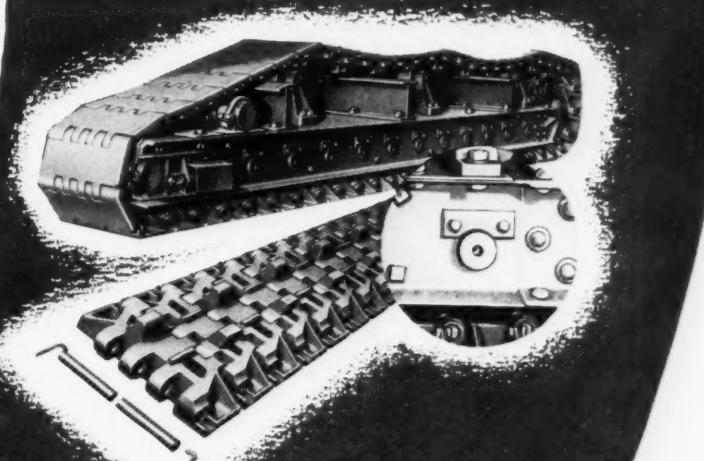
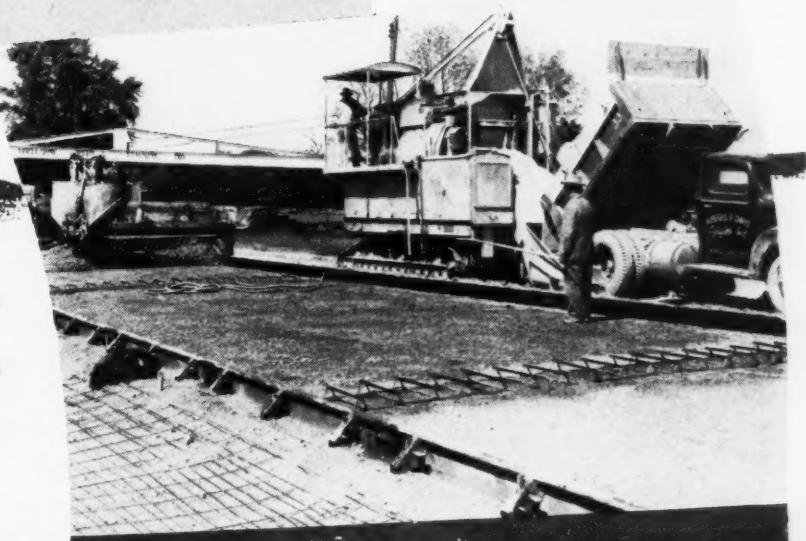
**S**HOES are wide—plenty of area in contact with the ground keeps the Duo Mix 34-E Dual Drum MultiFoote up on top. Treads are close fitting, eliminating the nut-cracker action that picks up stones and trash causing cracked treads.

Alternate lugs on treads permit the ejection of dirt giving a self-cleaning type of action.

Roller shafts are keyed into the side frame, eliminating the U-bolt hanger that weakens the flange.

Smooth idler end rollers eliminate jerky travel action and thereby reduce travel strain on the machine. Back this with simple adjustment and rugged construction and you have a crawler no other paver can equal. It's another one of the reasons why the MultiFoote Duo Mix 34-E Double Drum Paver is the smoothest, fastest Double Drum job on the road, today. Let us send you details.

**THE FOOTE CO., INC.**  
1910 State Street,  
Nunda, N. Y.



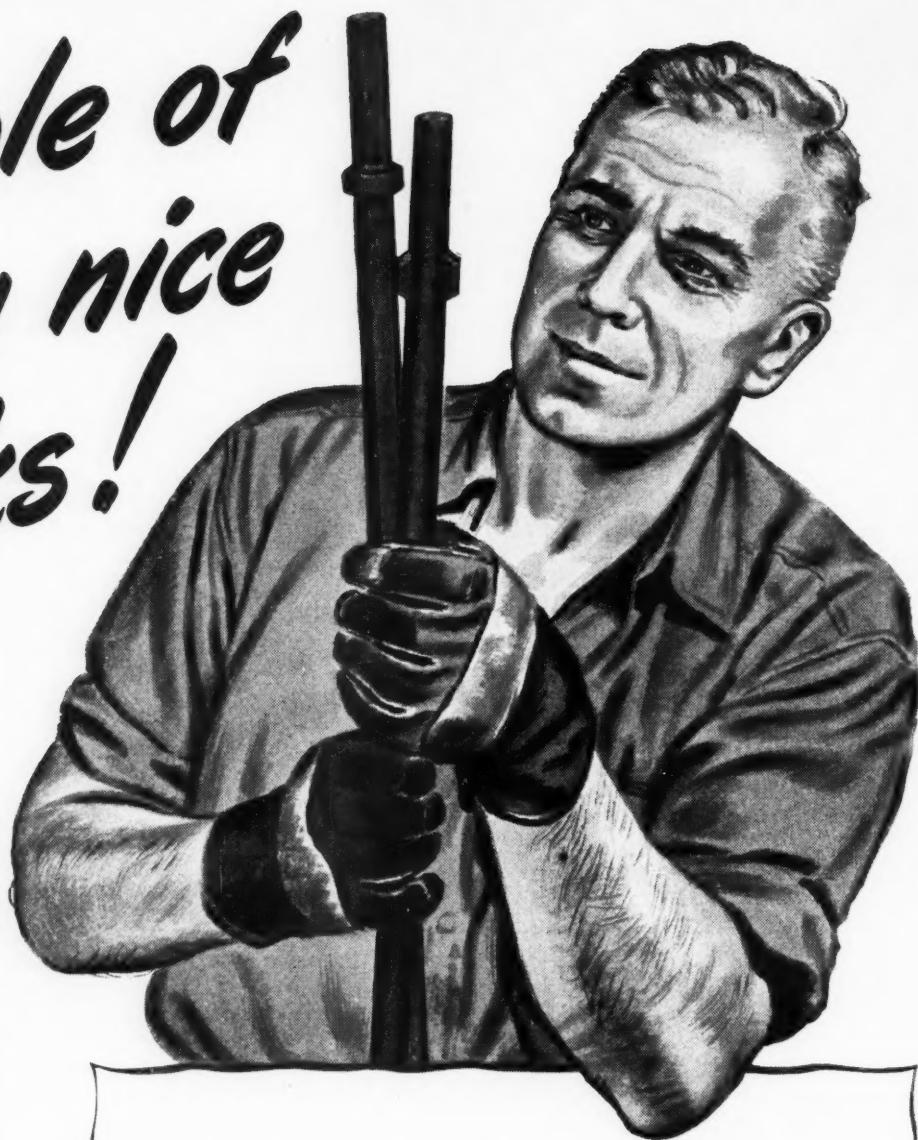
**MULTIFOOTE**  
*Duomix 34E*  
(DUAL DRUM)

*Builders of*

**ADNU BLACK TOP PAVERS**

**MULTIFOOTE CONCRETE PAVERS, AND FOOTE KINETIC MIXERS**

*A couple of  
mighty nice  
shanks!*



Yes, sir! Now there's the kind of shanks the drill runners really appreciate. The right shape . . . the right hardness. That means they get top footage, whether detachable or forged-on bits are used.

There's plenty of trouble when the shanks aren't right. I hear about it fast. So give me Bethlehem Hollow every time. It's easy to forge and there's nothing fussy about it when it comes to heat-treating.

With this "old reliable" it's no trouble at all to get accurate dimensions on my shanks. The lugs and collars forge clean and hold up fine—shift after shift.

It sure makes me a popular blacksmith around here when I've got Bethlehem Hollow to work with. And, it gives me more time to put on other jobs in the shop.

Bethlehem Hollow stays on the job longer.

*HERE'S WHY:*

- ★ The steel is always true to size. It performs like a champion when it comes to forging.
- ★ Its wide quenching range makes it easy to heat-treat and provides the ideal hardness.
- ★ Threads, shanks, and forged-on bits stand up under long, severe service.
- ★ The hole is smooth, true, and well-centered, minimizing fatigue failure.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

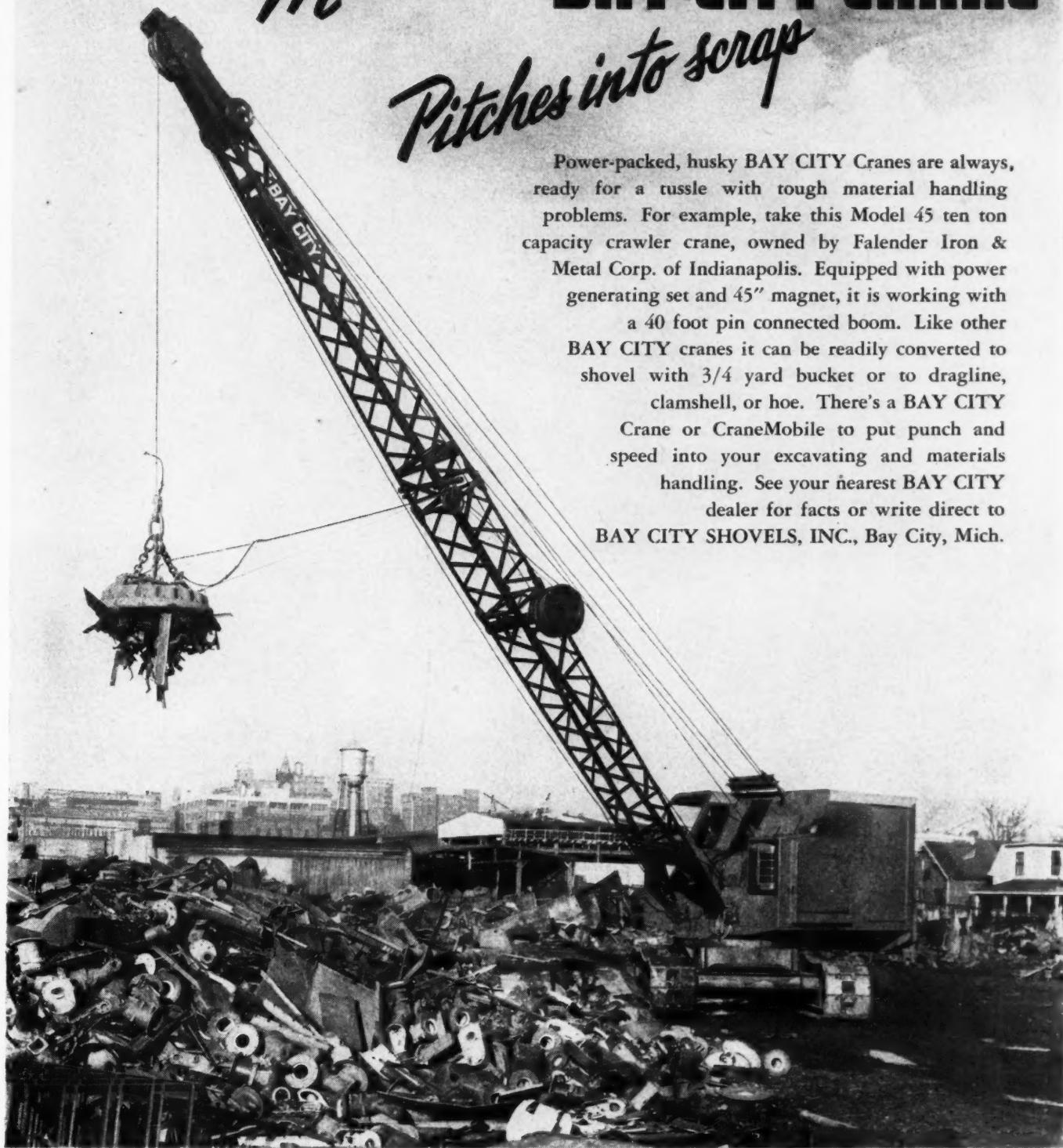
On the Pacific Coast Bethlehem products are sold by  
Bethlehem Pacific Coast Steel Corporation



**BETHLEHEM HOLLOW  
DRILL STEEL**

*Fast, Maneuverable*  
**BAY CITY CRANE**  
*Pitches into scrap*

Power-packed, husky BAY CITY Cranes are always, ready for a tussle with tough material handling problems. For example, take this Model 45 ten ton capacity crawler crane, owned by Falender Iron & Metal Corp. of Indianapolis. Equipped with power generating set and 45" magnet, it is working with a 40 foot pin connected boom. Like other BAY CITY cranes it can be readily converted to shovel with 3/4 yard bucket or to dragline, clamshell, or hoe. There's a BAY CITY Crane or CraneMobile to put punch and speed into your excavating and materials handling. See your nearest BAY CITY dealer for facts or write direct to BAY CITY SHOVELS, INC., Bay City, Mich.



**BAY CITY**



SHOVELS • DRAGLINES  
CRANES • HOES • CLAMSHELLS

SEE YOUR NEAREST DEALER for Bay City excavating and material handling equipment in sizes from  $\frac{3}{8}$  to  $1\frac{1}{4}$  yards having crane rating up to 20 tons. Both crawler and pneumatic tire mounting.



You can  
**LAY MORE PIPE PER DAY**  
when the Pipe is TRANSITE

The Transite Simplex Coupling is assembled in a simple, speedy operation. Each joint can be checked for proper assembly as the pipe is laid, providing advance assurance that the line will meet final test requirements.



Narrow trenches and minimum disturbance to pavement are important time- and money-saving advantages when laying Transite Pipe under city streets. And note, in the photograph at left, that no bell holes are required at joints.

Even the tough installations go fast when the pipe you're putting in is Transite.

One important reason for this is Transite's Simplex Coupling, the "packaged" joint that's made at the factory and simply *assembled* on the job. No caulking, no hot jointing materials are needed with this coupling. Tight, yet flexible, each joint can be deflected up to 5°—an additional time-saving advantage when laying pipe around curves and in hilly ground.

Easy handling is a factor, too. Transite's light weight means less time and effort required for unloading and lowering into the trench—and more footage carried per truckload.

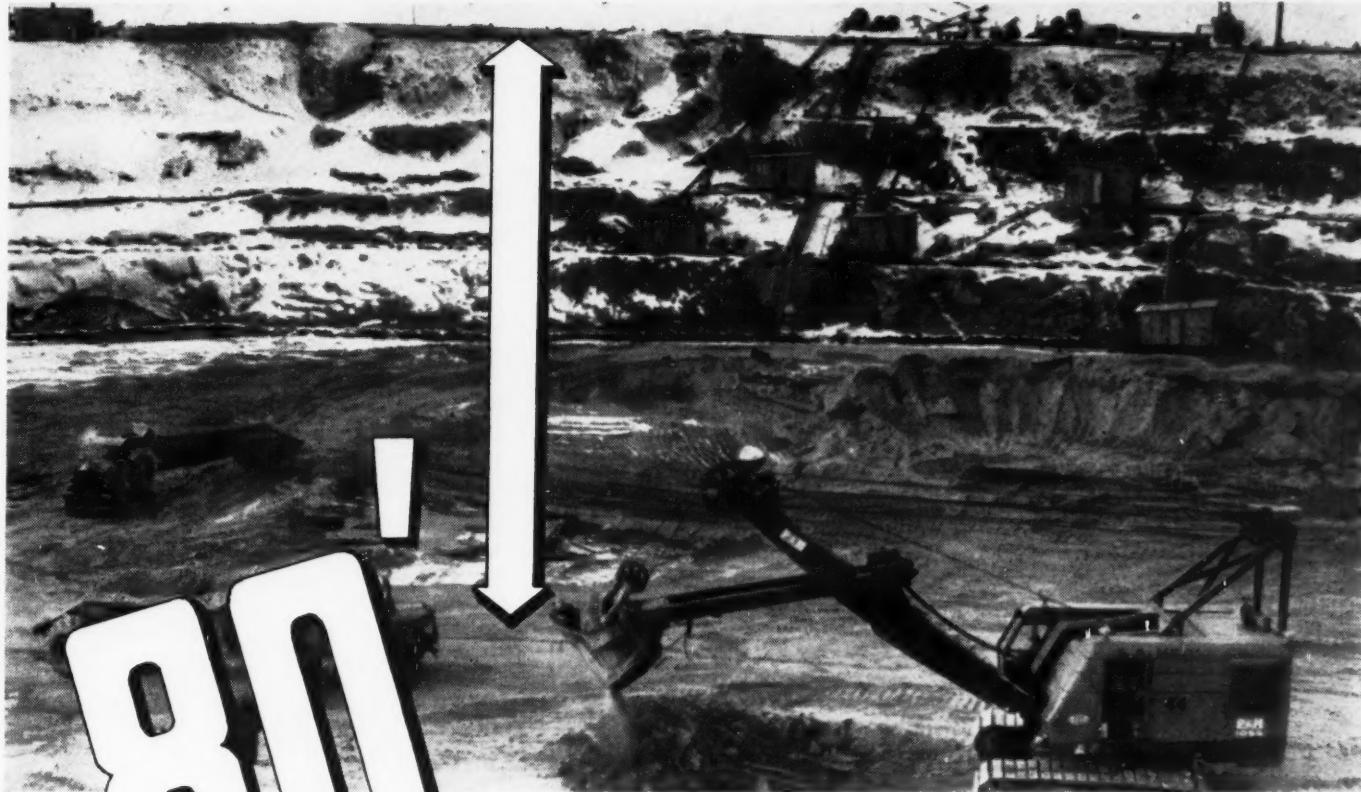
Every step of the way, your costs are lower with Johns-Manville Transite Pipe! And when the job is done, you can count on Transite's durable, corrosion-resistant, asbestos-cement structure to protect your good name by long dependable service underground. Johns-Manville, 22 East 40th Street, New York 16, New York.

JOHNS-MANVILLE  
**JM**  
PRODUCTS

**Johns-Manville TRANSITE PRESSURE PIPE**  
An Asbestos Product

# DIGGING DEEP and DRY

AT NEVERSINK DAM, NEW YORK



Eighty feet of water on this \$20,000,000 project for the Board of Water Supply, New York, was lowered below subgrade by successive stages of MORETRENCH WELLPOINT EQUIPMENT. Material—clayey sand.

Six years ago a Moretrench Wellpoint System was used on the Exploratory Caisson Pits at this site by George M. Brewster and Son. The present contract is held by S. A. Healy Co. When it's a question of pumping, these two experienced contractors choose MORETRENCH — again and again.

THINK IT OVER!

## MORETRENCH CORPORATION

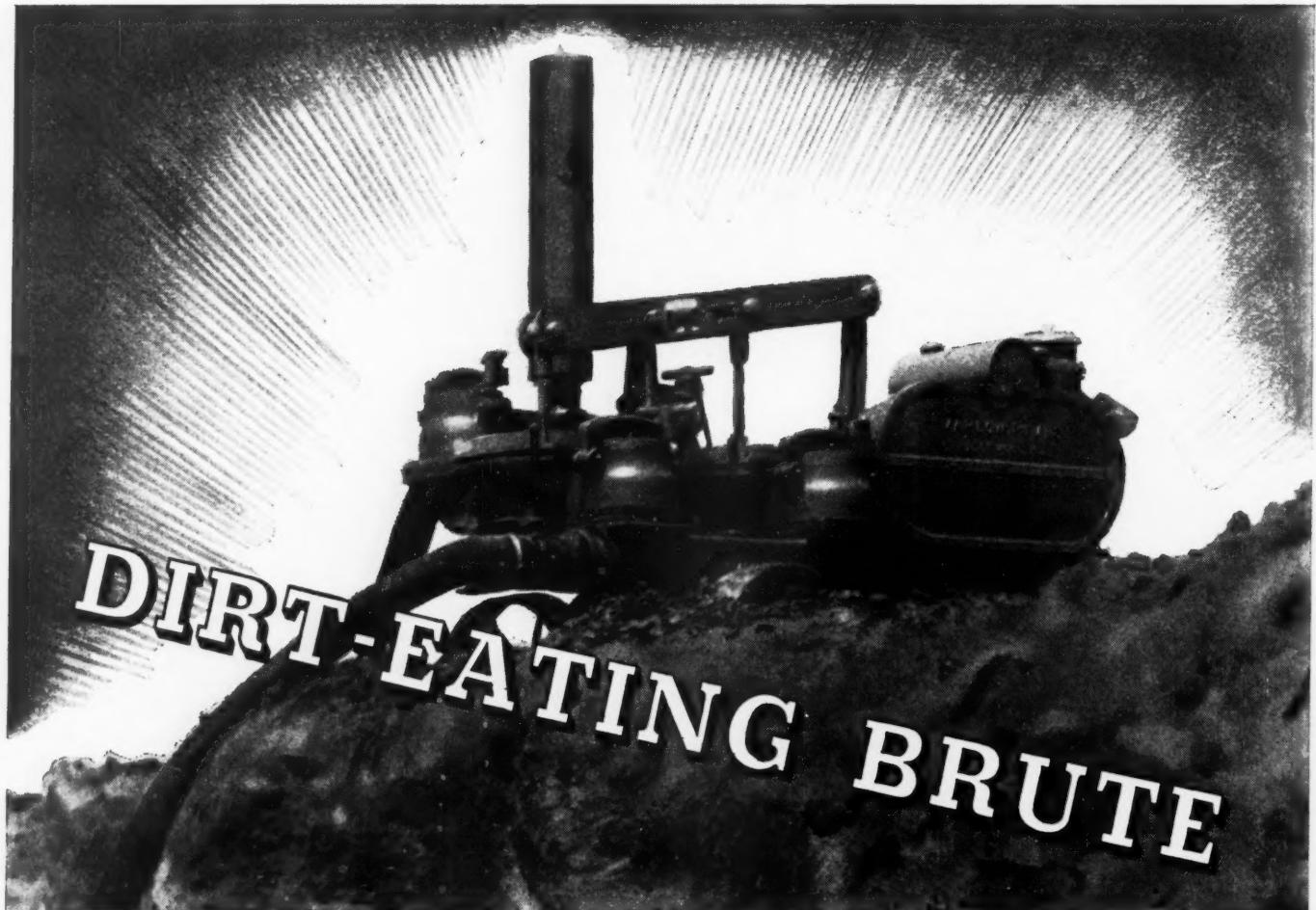
90 West St.  
New York 6

3037 S. Christiana Ave.  
Chicago 23, Illinois

2424 Chicago Ave.  
Tampa 6, Florida

315 W. 25th St.  
Houston 8, Texas

Rockaway  
New Jersey



A Marlow "Mud Hog" isn't pretty to look at. It is a homely, dirt-eating brute of a pump. It can see you through the toughest kind of pumping.

If you ever are likely to be on a job where there's muddy seepage, water filled with trash, or heavy material to be pumped, you should have at least one Marlow "Mud Hog" among your equipment. Send for a "Mud Hog" catalog now and study their features and advantages.

## MARLOW PUMPS

516 GREENWOOD AVE.  
RIDGEWOOD, N. J.

MANUFACTURERS OF QUALITY PUMPS SINCE 1924



# MCKIERNAN-TERRY PILE HAMMERS chosen for this ingenious, time-saving job

**McKiernan-Terry Pile Hammers driving steel H-piles for the new 600-foot pier of Seatrain Lines, Inc. at Edgewater, N. J. The 9-B-3 hammer shown at left is driving batter piles. The 11-B-3 hammer at right is handling vertical piles.**

To construct the new Edgewater, N. J. pier of Seatrain Lines, Inc. in shortest possible time, the contractors, J. Rich Steers, Inc. used this unique pile-driving procedure.

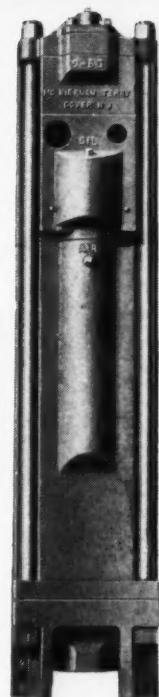
A row of leads, mounted on a barge to correspond with the spacing of a bent of piles, permitted driving thirteen heavy 14-inch steel H-piles without need of moving the barge.

These piles had to be driven in sections and splice-welded. With piles set up in several leads, welding operations in one lead were done simultaneously with driving in another.

For the past fifty years McKiernan-Terry Hammers have been chosen for difficult or complicated pile-driving jobs because of their dependable power, speed and safety. A complete, standardized line of McKiernan-Terry Double-Acting Hammers in ten sizes, Single-Acting Hammers in five sizes and Extractors in two sizes offer the contractor prompt deliveries.

#### POWER HAMMER FOR BLACKSMITHS

Send for Bulletin 56 describing the McKiernan-Terry Blacker Hammer—the "blacksmith's mechanical helper." Enables one smith alone to handle hand-forging jobs without human helpers around the anvil. Handles jobs faster, with fewer reheatings, increasing shop output.



**These  
FREE  
Bulletins  
Give Full  
Information**

Write for McKiernan-Terry Bulletins No. 55 and No. 57 giving specifications, diagrams, advantages, etc., of double-acting and single-acting pile hammers.

MK-235



**McKiernan-Terry**  
**CORPORATION**  
*Manufacturing Engineers*  
14 PARK ROW, NEW YORK 7, N. Y.



## LOOK AT THOSE TRACKS!

The LS-50 "signs off" with clean track marks. Shows how easy it is to maneuver this machine—no jerking, no jamming—just a smooth, even turn because steering action, like all the other controls, is correctly designed and built.



## LINK-BELT SPEEDER LS-50 *proves FAST and MANEUVERABLE* on Typical Highway Job

When the owner took delivery on this new LS-50 Shovel he put it to work at once on an important regrading and resurfacing contract, involving a lot of digging. And at once he discovered he had acquired a real shovel, that works fast, handles easily and maneuvers smoothly.

Day after day it is delivering record yardages of gravel from a 10 foot bank, keeping 9 trucks busy on a 2 to 6 mile haul. In addition to being satisfied with the power, speed and easy handling,

which were all he had expected, the operator is especially happy about the smooth action of the drive and steering mechanism, which saves time and effort in maneuvering the machine into working position, as well as being extra easy on gears, clutches and brakes.

Performance like this doesn't just happen. It is designed and built into the machine, and into every one of the 25 Link-Belt Speeder models, from  $\frac{3}{8}$  to 3 yard capacity.

- In the Link-Belt Speeder line there is a size of machine to fit every requirement of the general construction industry—and every Link-Belt Speeder machine is quickly and easily convertible for use as shovel, crane, dragline, pile driver or trench-hoe. The broad range of sizes and multiple-use features enable the operator of a Link-Belt Speeder to do more work, more kinds of work, more of the time!

For Prompt, Efficient, Convenient Sales and Service:  
There is a Link-Belt Speeder Distributor Located Near You

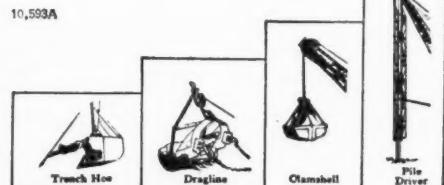
## CONVERTIBILITY COUNTS, TOO! . . .

The LS-50, like all Link-Belt Speeder Shovel-Cranes, is quickly and easily converted for use with any of the usual front end attachments. Whatever the job is, you can do it with a Link-Belt Speeder!

**LINK-BELT SPEEDER**

*Builders of the Most Complete Line of*  
**SHOVELS-CRANES-DRAGLINES**

LINK-BELT SPEEDER CORPORATION, 301 W. PERSHING ROAD, CHICAGO 9, ILL.  
A DIVISION OF LINK-BELT COMPANY



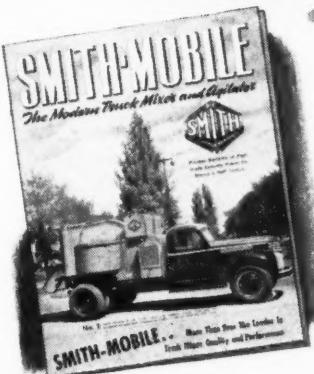
10,593A

CKS!

in clean  
easy it  
chine—  
just a  
because  
the other  
signed



*Here's **NEW BEAUTY**  
That Helps Me Sell Concrete!*



New Bulletin Just Off the Press!

Gives you all the facts, dimensions and specifications of the improved SMITH-MOBILE models. If you haven't already received yours, be sure to ask for a copy.

"Yes, Sir . . . on every trip, the new 1947 Smith-Mobile's handsome appearance helps advertise my business . . . virtually acts as my concrete salesman."

Smith-Mobile's beauty is achieved largely by functional styling. Mixer engine, transmission, water pump, valve system and all moving parts are completely enclosed in a streamlined housing. And these improved Smith-Mobiles are easy to keep handsome . . . easy to "hose off" between trips. The roomy charging chute prevents spilling of dry aggregates or cement. And the perfected drum closing door seals batch in drum . . . keeps concrete from seeping out in transit.

Improved performance goes along with new beauty. Drums are larger, yet overall weight is materially decreased. Dual water injection system prevents freezing in cold weather. Direct-connected motor has 3-point suspension. Simple, lightweight transmission is foolproof. Drum rides on Timken Roller Bearings in rubber-cushioned case.

Four popular sizes. The demand for these improved Smith-Mobiles is still much greater than the supply. But deliveries are being stepped up by greatly increased production. Get the complete Smith-Mobile story — today!

THE T. L. SMITH COMPANY, 2851 N. 32nd Street, Milwaukee 10, Wisconsin, U. S. A.

# SMITH MOBILE

*The Original High Discharge Truck Mixer and Agitator*



# FIRST CHOICE —everywhere!

HERE'S the *right* tire for drawn vehicles and general traction—for low-cost, high-hour performance. It's Goodyear's All-Weather Earth Mover—sure-footed and easy rolling because its wide, rounded contours prevent deep penetration of the ground surface, reduce skids and slippage.

Not only the Earth Mover, but *all* Goodyear work tires are first choice with heads-up operators everywhere. And due to low-cost, long-life performance, Goodyears stay first choice. Year after year, *more yards are moved on Goodyear off-the-road tires than on any other kind!*

THE RIGHT TIRE  
FOR EACH JOB



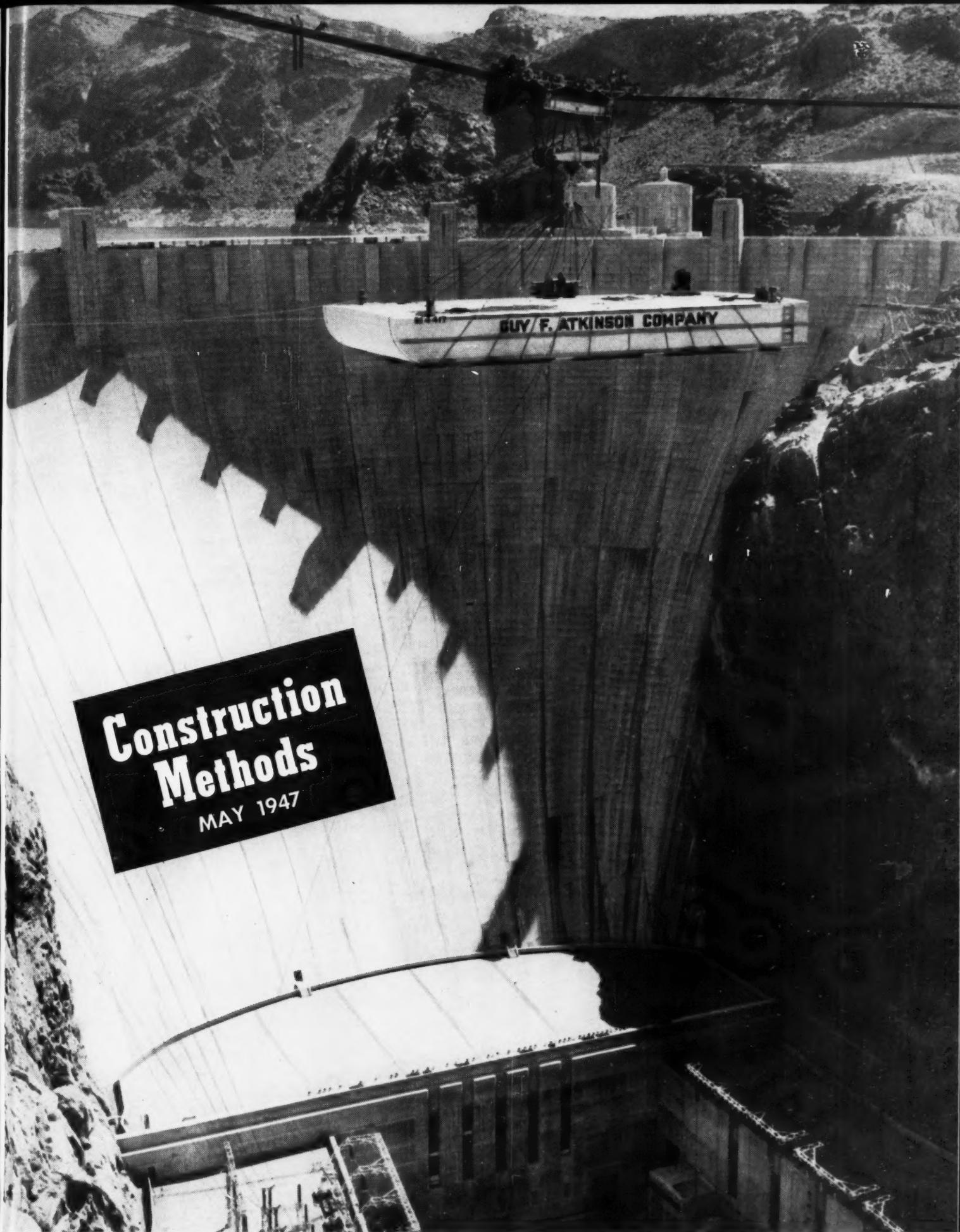
for maximum traction  
on drive wheels

for super stamina  
in all rock work

All-Weather, Sure-Grip, T. M. is The Goodyear Tire & Rubber Company

# GOOD YEAR

MORE YARDS ARE MOVED ON GOODYEAR OFF-THE-ROAD TIRES THAN ON ANY OTHER KIND



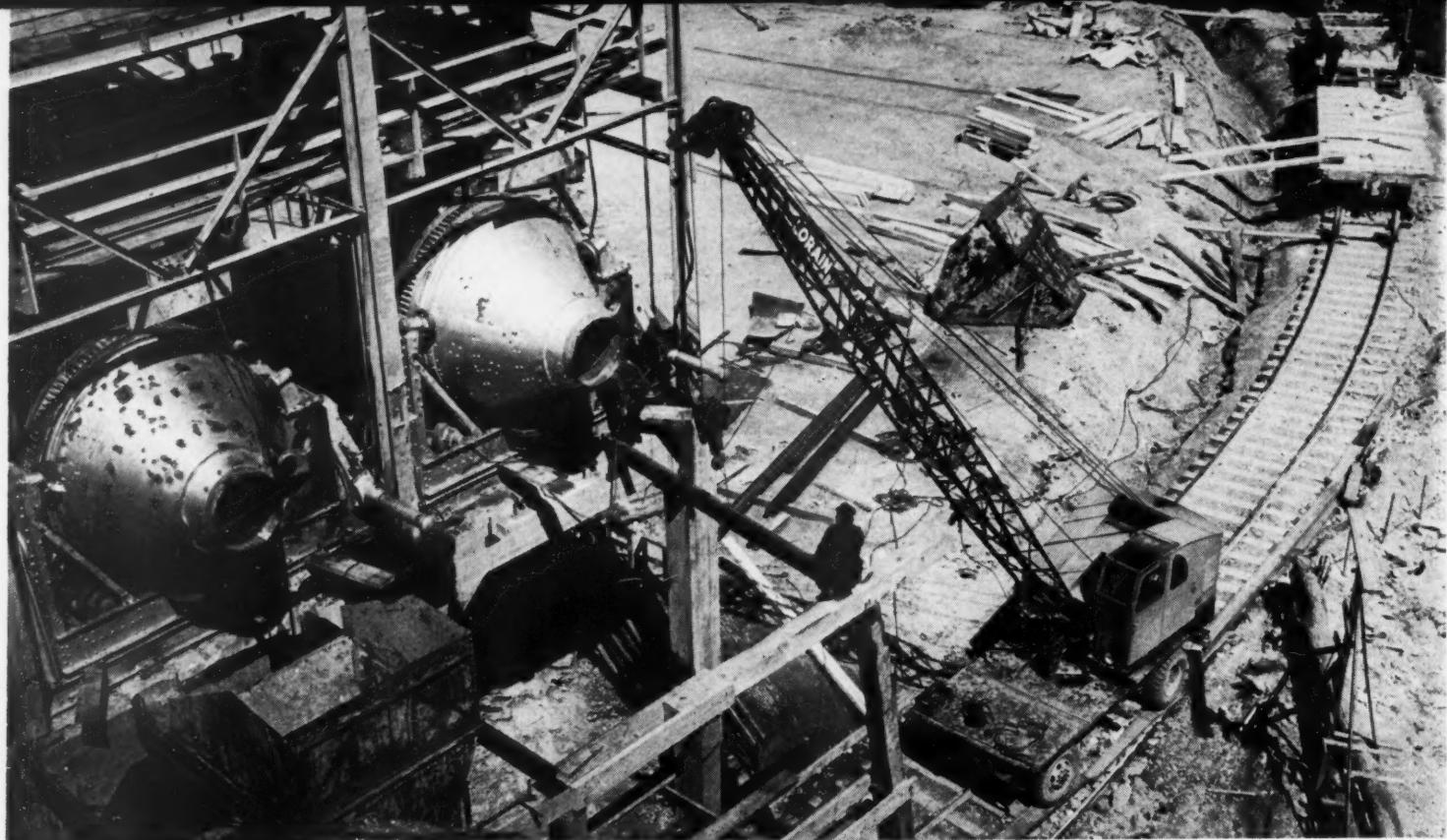
## Construction Methods

MAY 1947

William S. Russell Photo

**T**IMBER BARGE TAKES HIGH RIDE AT BOULDER DAM—Incongruous as it may seem, here is a barge high in the air in the middle of a desert. Guy F. Atkinson Co., in preparation for a 2½-million-dollar job of altering the Boulder Dam tunnel outlets and excavating debris from the river bed,

built this 40x80-ft. 122-ton barge on top of the dam and lowered it into the river at bottom of the canyon by the dam's permanent cableway. Barge, with 200-ton capacity, floated heavy rigs to excavation site. An article on Atkinson's interesting job will appear in the June issue.



MIXING PLANT housing Blaw-Knox batcher and a pair of Smith 4-yd. mixers is erected by Lorraine truck crane. Car being fabricated in background will transfer 8-yd. concrete buckets from mixers to cableway over short track shown here.

# ALLATOONA DAM

## Ready for CONCRETE

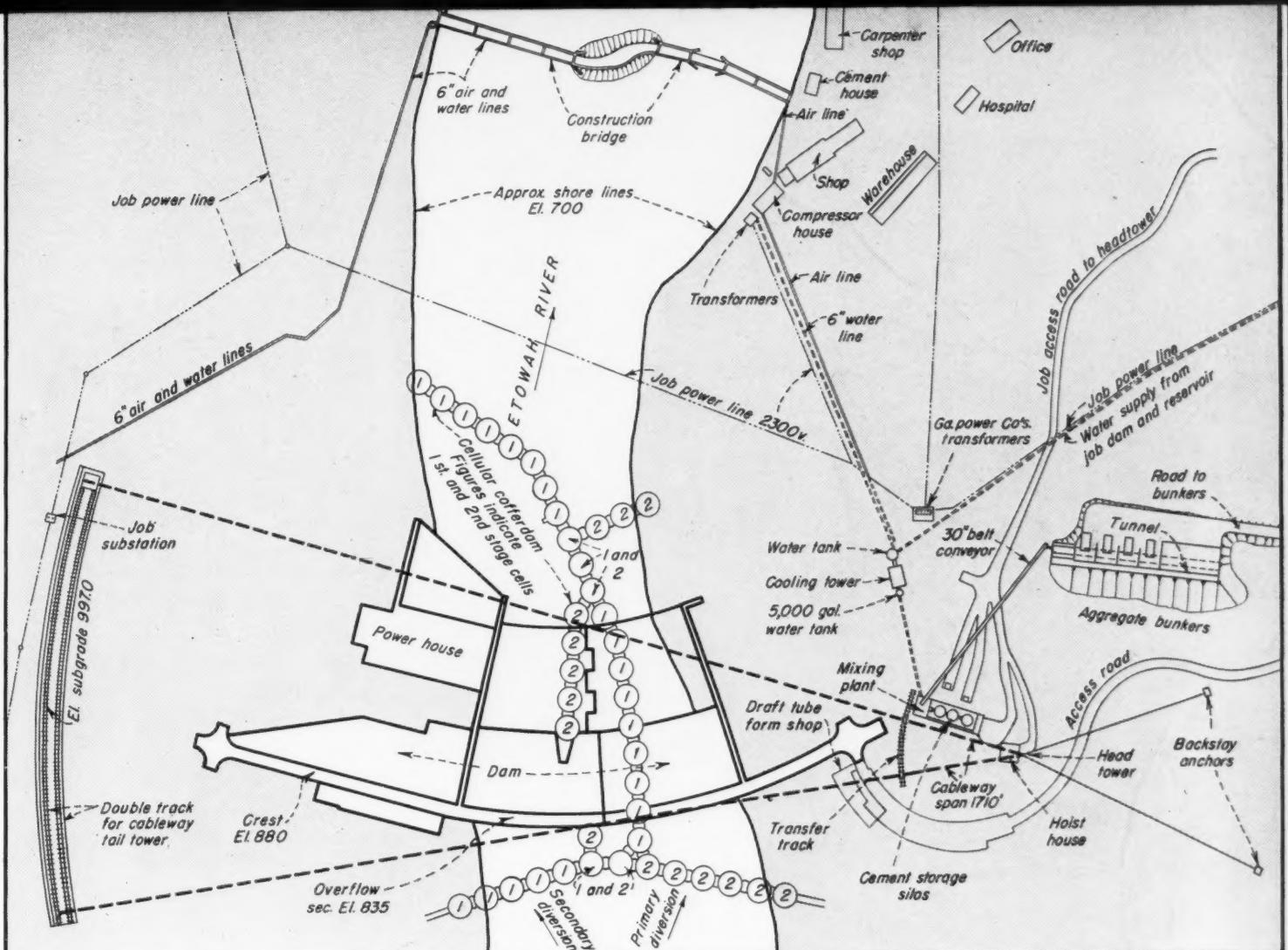
WAY DOWN IN GEORGIA National Constructors, Inc., are ready to place concrete in the Allatoona Dam in the Etowah River gorge after nine months of intensive and intelligent preparation. The dam, being built by the Mobile District, U. S. Corps of Engineers as a combined flood control and power project, is a concrete curved gravity structure, 1,225 ft. long at the crest and 200 ft. high. A gate-controlled center overflow section will serve as the spillway. The project is designed to alleviate floods in the Rome area, 48 mi. downstream. Initial power installation is two 40,000 kva. units, with provision for a future third unit, and a 2,500 kva. service unit. Principal quantities include 500,000 cu. yd. of concrete and 450,000 cu. yd. of excavation, much of it rock.

National Constructors, Inc., made up of Arundel Corp., Baltimore, Hardaway Contracting Co., Columbus, Ga., and L. E. Dixon Co., San Gabriel, Calif., were awarded the main contract last summer for \$13,300,000. The combine turned construction operations over to Dixon, and they put veteran Wm. N. Evans on the job as project manager. The Army Engineers named Charles A. Jackson, who knows construction as well as engineering, as resident engineer. This team of Bill Evans and Charlie Jackson are turning out one sweet construction job.

Diversion plans call for a two-stage cofferdam. The first encompasses the powerhouse and half the dam on the left bank. Low slots will be left in this part of the dam for the second stage diversion when the cofferdam incloses the right-bank section. The



START of first-stage cofferdam on left bank of Etowah River. Wiley Whirley gantry crane, riding on fill berm, drives steel sheets for 40-ft. cells around double wood template.



JOB LAYOUT for building Allatoona Dam reveals strategic placing of various plant units. Shops, compressor plant and offices are on river bank flat below dam; aggregate storage and concrete plant are on top of right bluff within easy reach of cableway; traveling tail tower high on left bank permits blanketing of dam with cableway. Only a few of necessary access roads are shown here. Note cellular cofferdam layout for first and second stage diversions. River will be diverted through low slots in dam during second stage.



A GREAT CONSTRUCTION TEAM at Allatoona Dam are BILL EVANS (left) project manager for National Constructors, Inc., and CHARLIE JACKSON, resident engineer in charge for Army Engineers.

first-stage cofferdam has been built and excavated. It is a remarkably tight cellular structure of 27 40-ft. cells spaced 50 ft. apart, c. to c., tied together with short arcs. Steel sheeting was driven in various lengths to give at least 40 ft. of freeboard above low-water level, the length being determined by borings. As shown by the accompanying job layout drawing, five of the first-stage cells will be incorporated into the second-stage cofferdam. While four 4-in. pumps have been installed in the first

CABLEWAY HEAD TOWER (below) and mixing plant are on top of right-bank bluff. On side of bluff below head tower can be seen trestle supporting temporary form shop for fabricating draft-tube forms. First-stage cofferdam in foreground incloses powerhouse and half of dam. Winding up far hill is north access road over which aggregates will be hauled.





**LEFT ABUTMENT** has been stripped and dam foundation trench has been excavated. Stripping was loaded by shovels into trucks for disposal over various access roads cut into hillside. Double track for cableway traveling tail tower is partly on fill, partly in cut above core trench. Cofferdam serves as roadway for access to upper left bank.

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**CABLEWAY HEAD TOWER** (below) is guyed steel structure atop right bank bluff. Building houses 500-hp. electric hoist and control apparatus.



cofferdam, one pump running part-time keeps the 7½-acre enclosure dry.

Steel sheeting for the cofferdam cells was driven by a Wiley Whirley gantry crane. Two complete circular wood templates were set up in each cell as a guide. Excavation of the site, both the abutment and cofferdam areas, is by Link-Belt and Koehring shovels, loading into a fleet of Euclid 11-yd. end-dump trucks for disposal. Most drilling is by Ingersoll-Rand wagon drills using detachable Jackbits that are sharpened by hot milling.

Completely blanketing the dam area is a 20-ton high-line cableway, spanning 1,710 ft., with a traveling tail tower high on the left bank. The tail tower, mounted on a pair of standard-gage railroad tracks,

**FINAL EXCAVATION** in first-stage cofferdam is benched down with group of Ingersoll-Rand wagon drills (below) using detachable bits. Air for drills comes from central compressor plant way below dam.



has a travel of 750 ft., and is operated by remote-control from the head tower on the opposite bank. A 500-hp. electric hoist and control apparatus are located at the foot of the guyed steel head tower.

High on the right bank, near the head tower, is the mixing plant containing two 4-yd. Smith tilting mixers, a Blaw-Knox batching plant and three 2,000-bbl. silos for bulk cement. Close by is a series of aggregate bunkers that feed to the plant by a belt conveyor in an Armco plate tunnel. Bunkers are on a new access road built in from the north, over which aggregates will be truck hauled 15 mi. from a quarry where all aggregates, including sand, will be produced from crushed rock. Air-entrained cement will be used throughout, and the contractors contemplate that the harsh mix usually resulting from manufactured sand will be tempered somewhat by the cement.

Concrete will be discharged from the mixers into 8-yd. controlled dump buckets that will be shunted to within reach of the cableway by a rail-mounted transfer car. The buckets will be designed for partial dumping to meet the engineers' objection to 8 yd. being deposited in one spot. Concreting will begin some time in May.

Two main access roads had to be built, one from either side of the river, and below the dam is a construction bridge across the river to serve the compressor, shop, hospital and office area. A Georgia Power Co. line delivers current at 38,500 v. to a job transformer station. Principal job distribution lines are 2,300 v., leading to small transformers.

An excellent shop has been es-



**GETTING CLOSE TO GRADE** in first stage cofferdam excavation. Link Belt and Koehring shovels load rock into fleet of 11-yd. Euclid end-dump trucks. Bulldozer cleans up fly rock and spillage from trucks.

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tablished alongside a central compressor plant on the right river bank. The shop, equipped for heavy repair work, includes the drill sharpening and furnace units. A total of 3,000 cfm. air is produced at the central compressor plant by two Gardner-Denver and three Ingersoll-Rand compressors.

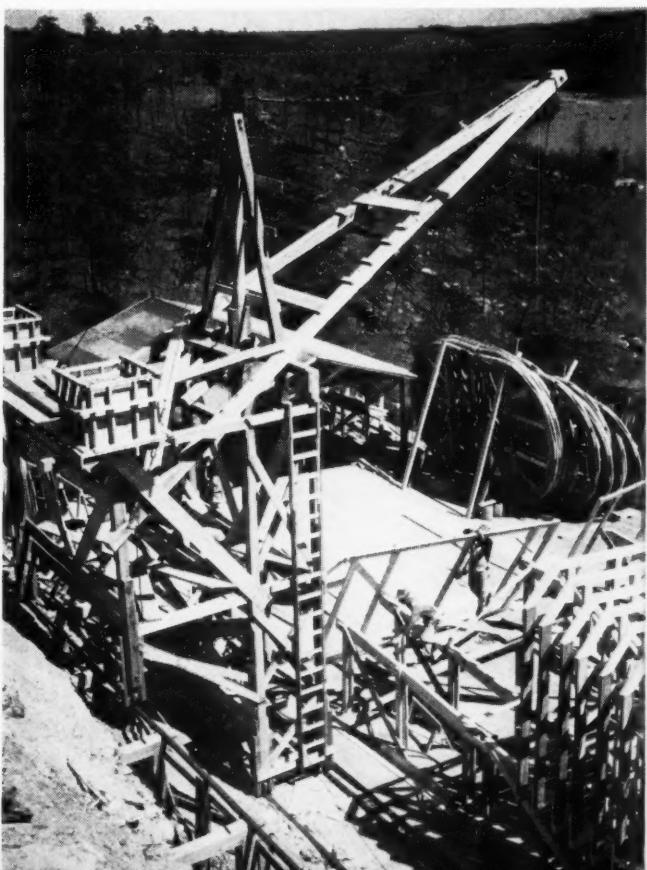
High on the steep right bank is a temporary form shop and platform where draft tube forms are

being made. The platform is built out over the cliff on a trestle. A shed at one end of the platform houses band and circular saws. A traveling A-frame (shown on our cover picture), powered by air motors, shifts the completed form sections to within reach of the cableway for transfer to the powerhouse area across the river from the form shop.

Col. Mark Boatner is District

Engineer at Mobile. His office prepared the plans and is supervising construction. The Mobile office is under the South Atlantic Division, U. S. Corps of Engineers, for which Col. Geo. C. Gillette is Division Engineer. Charles A. Jackson is resident engineer in charge of construction for the Army. Wm. N. Evans is project manager for National Constructors, Inc., the contractors.

**TRAVELING A-FRAME** (below) transfers draft-tube form sections fabricated on this right-bank platform to within reach of cableway for transportation across river to powerhouse site. Job-made derrick rolls on stepped rails; hoist and travel are powered by air hoists; boom is fixed.



**TAIL TOWER** (below) on left bluff travels on double track over 750-ft. sweeping curve. Box between tracks is for power cable as it unreels from fixed position at far end of track. Note heavy concrete counterweights on tower. Travel is controlled by operator in hoist house at head tower, 1,710 ft. across gorge.



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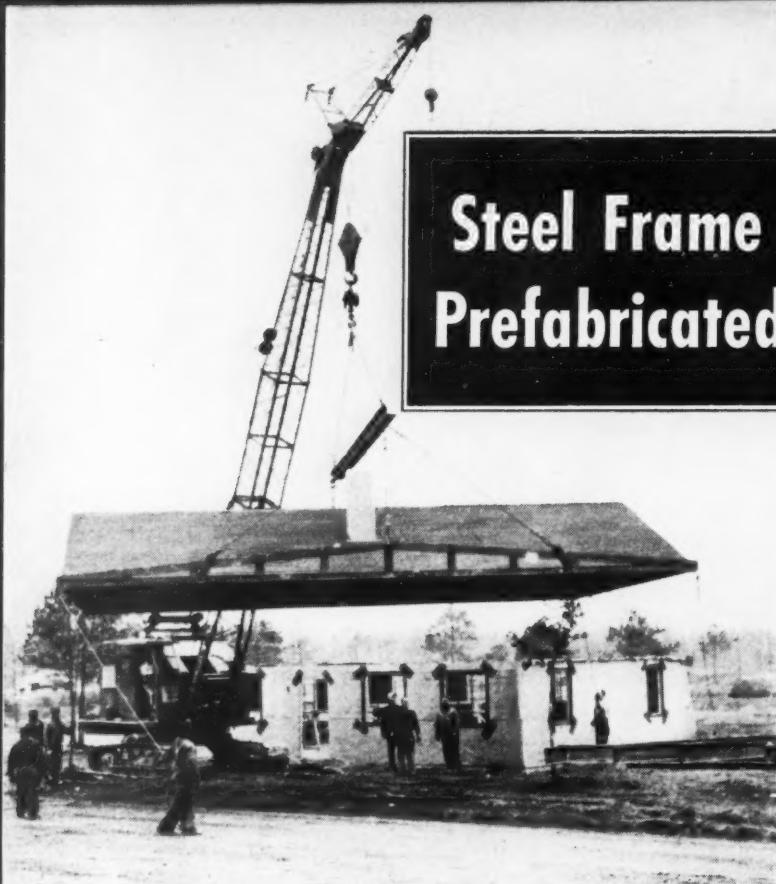
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## Steel Frame Houses Prefabricated at Site



**COMPLETE ROOF ASSEMBLY** weighing 4 tons is placed on 26x38-ft., 3-bedroom house at Byrne Organization's \$8,000,000 community near Baltimore. Walls and roofs of steel frame dwellings are prefabricated on assembly lines at site of 1,200-home project and are erected in 40 min.



**LONG WALL** is placed on foundation by Marion crane with 50-ft. boom and 10-ft. jib. Window sash has been installed and corners of openings are reinforced with metal lath. Basic house has stucco exterior but aluminum, redwood or asbestos siding or brick veneer is available.

**SITE-PREFABRICATION** of house components on assembly lines at its 1,200-home community near Baltimore enables the Byrne Organization, Washington, D. C., economically to construct and erect up to ten one-family dwellings a day in 1,000 man-hours each. At the \$8,000,000 development, Harundale, complete roof assemblies, and steel wall frames with insulation and lath attached, are trucked from fabricated shops

on the 300-acre project and erected by crane in 40 min.

The Byrne houses are detached basementless 26x38-ft. one-story units on landscaped 60x100-ft. plots, and will be sold for less than \$7,000. Foundations are 12x12-in. concrete grade beam and 4-in. floor slab in which radiant heating coils are embedded. Walls, are 1-in. stucco exterior and 3/4-in. plaster interior on 3 3/4-in. studs welded of Macomber nailers (a

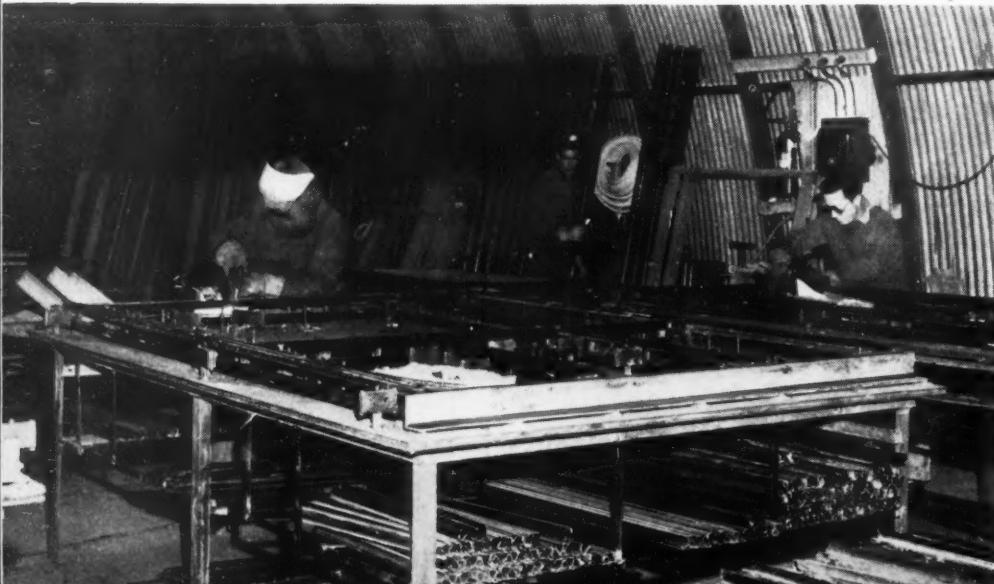
16-gage steel  $\Omega$ -section), while roofs are steel trusses sheeted with 1/2-in. plywood, 15-lb. asphalt felt and 210-lb. asbestos shingles. The houses are insulated with Fiberglas in walls and ceiling.

Prefabrication and assembly shops at the project are housed in nine Stran-Steel Quonset build-

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**WALL SUB-PANEL** is assembled (below) on jig in 180-ft. Quonset hut shop. Note pinned rotating wedges that position and hold members during welding. Pre-cut material is stored beneath tables.

**WALL PANEL BOLTS** (below) are embedded in grade beam foundation poured within metal-faced cantilever forms pinned and wedged to grade. Forming and stripping are speeded by hinged corners and hasp-and-staple joints on uniform length panels with attached slotted bolt spacers.



ings totalling 1,120 ft. in length, and are coordinated to turn out one set of house components per hr. In the wall assembly shop Macomber steel strips are cut to length and welded into sub-panels on steel jig tables. Ingenious rotating wedge blocks on vertical pins on the table top position the steel members securely yet the blocks may be quickly removed or turned out of the way for easy lifting of the assembly from the jig. The sub-panels, complete with steel door and window framing, are placed in a larger similar jig where the full wall length is assembled. After welding, an electric monorail hoist moves the wall to a vertical rack where prefabrication is completed. Here 1-in. insulating board is laid on, then covered with Steeltex paper-backed wire mesh stucco reinforcing. Large-headed pins welded to the wall studs by Nelson gun securely hold the double layer to the panel. On the other side, building paper and expanded metal lath for plaster are nailed to the Macomber stud after outlets, switches and dimensioned wire runs, preassembled in the electric shop, are installed.

**ROLLER CONVEYOR** in roof fabricating shop carries pre-assembled steel trusses along production line. Shop turns out one complete roof per hr.

Roof trusses of Macomber nailers and steel tierods are welded on jig tables at one end of the roof fabricating shop, then assembled 2 ft. c. to c. on end guides set on roller conveyors. As the assembly rolls through the shop, diagonal end and stay bracing is welded, gable ends and preassembled chimney are affixed, and sheeting and shingles are nailed on.

At the heating shop, grids for the oil-fired radiant heating systems are made in sectional assemblies on templates. Grids are  $\frac{1}{2}$ -in. copper pipe on 15- to 18-in. centers and are wired to wood skeleton frames for handling. In addition, pipe assemblies to boiler, expansion and domestic water tanks are made in the shop to reduce field connections. A plumbing shop provides a complete assembly for underground waste lines, vents and wastes above the floor line, and water piping assemblies to be fitted in



ENTIRE WALL LENGTH, welded from sub-panels on assembly table, is raised for move to vertical jig by monorail hoist. Temporary channel head bolted to wall top, and permanent channel sill welded to bottom, stiffen long wall.

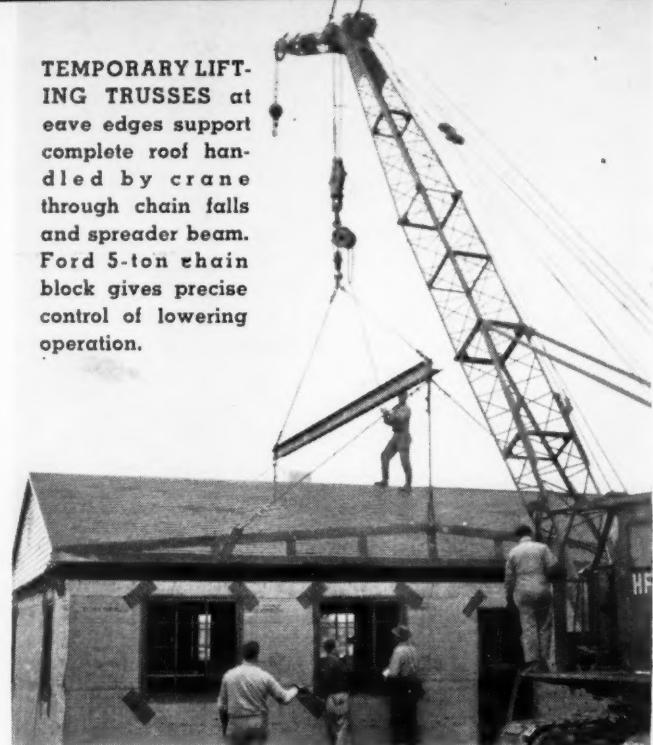


ROLLER CONVEYOR in roof fabricating shop carries pre-assembled steel trusses along production line. Shop turns out one complete roof per hr.





**TEMPORARY BRACES AND GUYS**, pre-cut to correct length, hold walls in exact position during shell erection. Long wall weighs 1,400 lb.; short wall 1,000.



**TEMPORARY LIFTING TRUSSES** at eave edges support complete roof handled by crane through chain falls and spreader beam. Ford 5-ton chain block gives precise control of lowering operation.



**HYDRAULIC EXCAVATOR** digs 8-ft. trench for 3,200 ft. of 30-in. storm sewer on 300-acre site. Gradall, a new type excavator, has tiltable bucket on end of telescoping 24-ft. boom that can turn about long axis as well as move in vertical and horizontal planes.

partitions. Other shops include a sheet metal shop where the flashing, gutters and downspouts are soldered up complete, a carpenter shop where sliding closet doors and other wood items are made, and a paint shop.

Trailer trucks deliver house components to the building site for erection by crawler crane. Walls are set in mastic and secured to the grade beam by  $\frac{3}{4}$ -in. bolts, and are guyed and cross-braced while the roof is placed. Shell erection is completed by welding the top of the wall studs to a stringer strip along the bottom of the roof trusses. Subsequent work—installing steel stud partitions, plastering, trim, stuccoing, glazing and painting—is done in a conventional manner.

**PLUMBING ASSEMBLY** is installed (below) prior to foundation construction. Piping is pre-assembled on spider and tested in shop.



**SLAB REINFORCING** of 6x6-in. No. 6 wire mesh is placed (below) on 6-in. tamped sand fill. Strip of Fiberglas under slab perimeter prevents excessive heat loss from radiant slab to grade beam.





DAY OKES

AN ANNUAL WAGE for construction workers is largely regarded as impossible, but Day Okes, president of Okes Construction Co., St. Paul, Minn., had such a plan in effect for his highway and heavy construction crews years ago. It was a simple plan. When necessary during the rush season the men worked long hours. During slack season they worked shorter hours or part time. Regardless of hours worked per week, the crews were paid a steady weekly wage throughout the year. The Wagner Act and other labor legislation of that time ruined the plan, for contractors could no longer work a man overtime without paying premium wages. Yet the Okes company has long enjoyed harmonious labor relations, employing union workmen based on the premise, as Day puts it, of "higher output per man for higher pay."

But labor relations are just one of his humanitarian interests. He has been active in contractor association affairs, both A.G.C. and A.R.B.A. For five years he has been a member of the Highway Division Executive Committee, A.S.C.E., and its chairman for the last two years. One of Day's outstanding extra-curricular jobs was heading up a joint engineering societies and industries committee that prepared a manual on "Opportunities for Veterans (World War II) in the Construction Industry".

Born in Chicago Sept. 17, 1883, Day Okes went north for his tech-

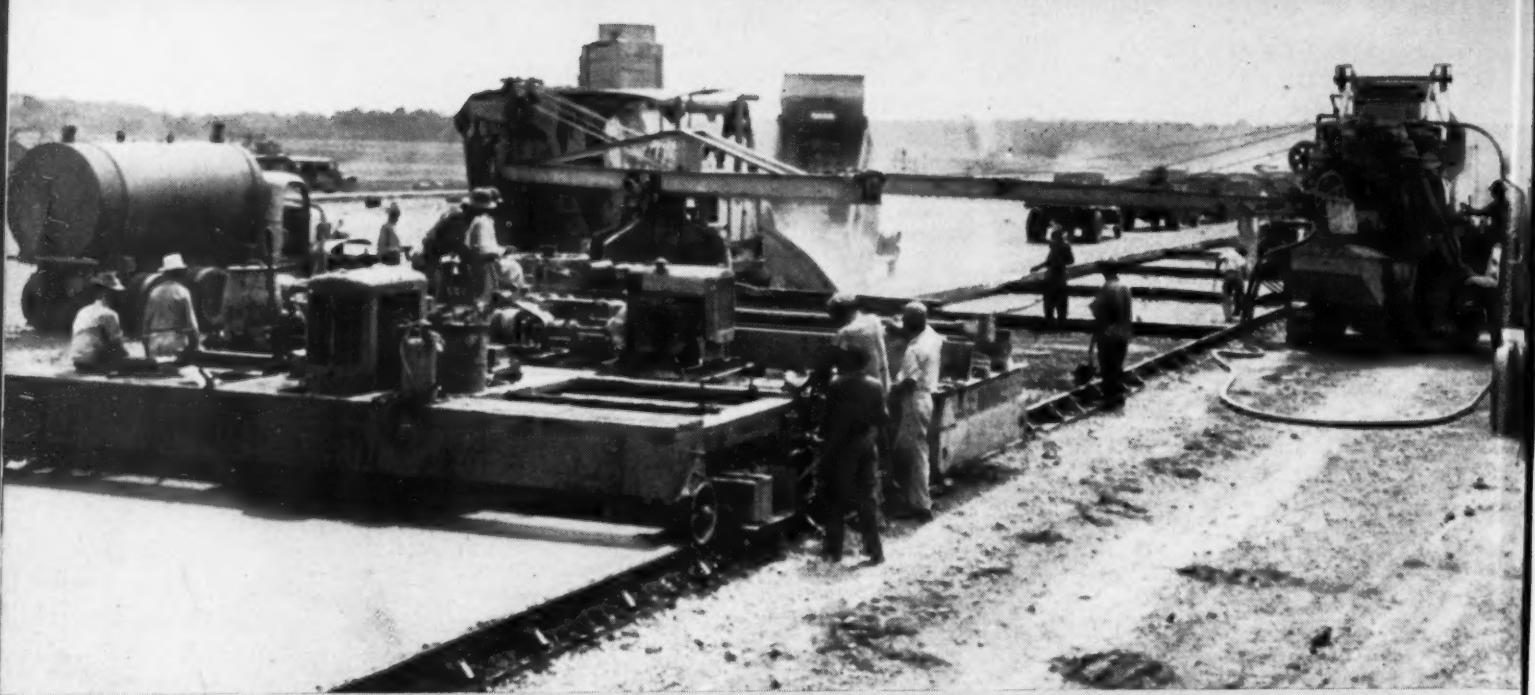
nical education, graduating in civil engineering from the University of Minnesota in 1908. For the next five years he was engineer for the Kettle River Co., producers of sandstone, paving blocks, and creosoted wood products. He also became manager of its subsidiary, Western Construction Co., of Des Moines.

In 1913 he became a partner in Hanlon & Okes, St. Paul contracting firm specializing in sewer, paving and river work throughout the Northwest. He took time out in 1917 to go overseas with the Corps of Engineers, returning as a Major to direct the Engineer Highway School at Camp Humphrey, Va. Upon the death of Mr. Hanlon in 1934 the company was reorganized as Okes Construction Co., and has

carried on as one of the leading contractors in the Northwest.

In recent years prominent projects carried out by the company include a joint venture in excavation for the third set of locks at Panama, building a large airfield in Nicaragua and managing the construction of 350 miles of the Alaska Highway. While located at Ft. St. John, B. C., on this last project Day became quite efficient in shooting and cooking Canadian wild geese. At present the company is building the town of Riverdale at the Garrison Dam project in North Dakota.

Day Okes, contractor, engineer and lover of humanity, is enjoying life in its fullest measure and is leaving a trail of good deeds behind him.



BIG PIECES of equipment train that is placing concrete pavement at record rates on Panama National Airport. Here, two 34E pavers

discharge from either side of strip. Note tank trucks that supply mixing water. Finishing machines are in foreground.

PRA Photo

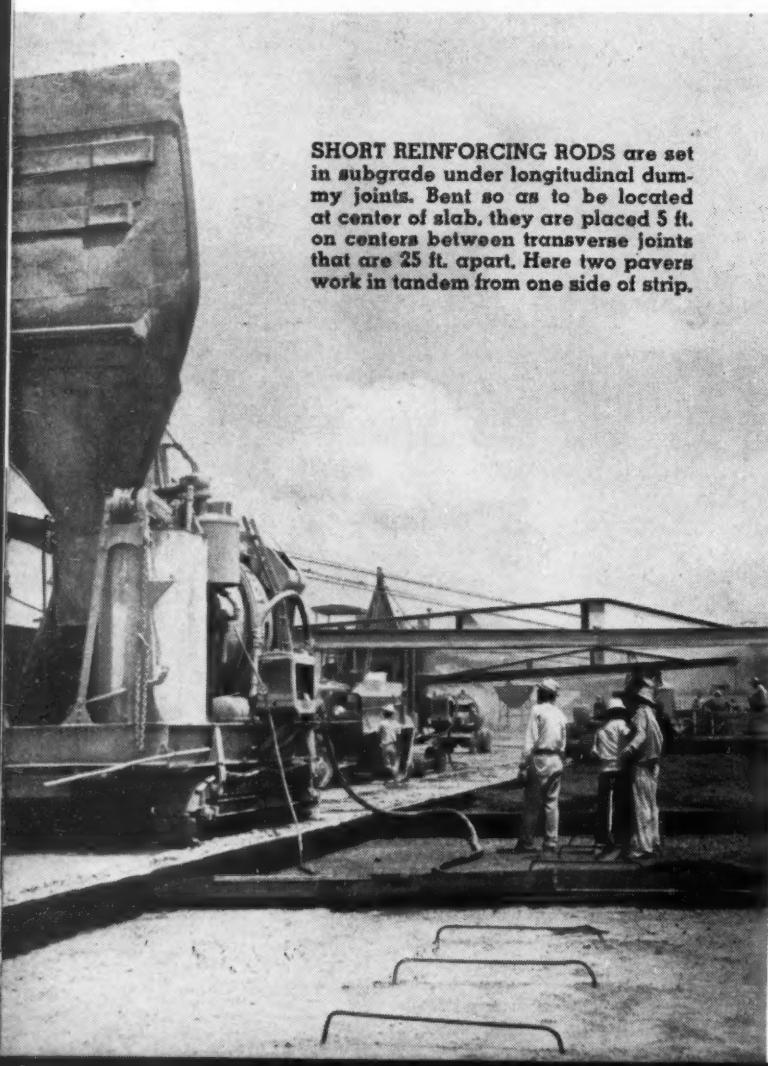
## PRA PAVES PANAMA AIRPORT AT ACRE-A-DAY CLIP

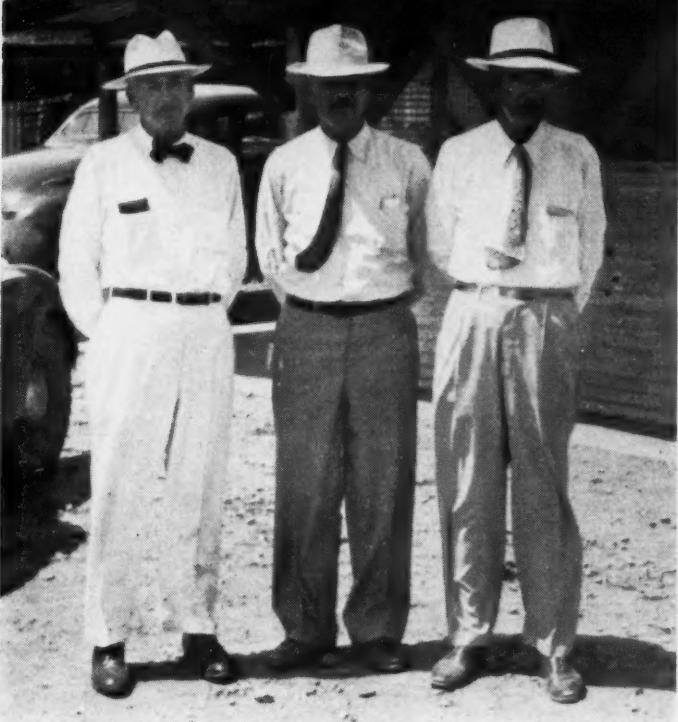
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**SHORT REINFORCING RODS** are set in subgrade under longitudinal dummy joints. Bent so as to be located at center of slab, they are placed 5 ft. on centers between transverse joints that are 25 ft. apart. Here two pavers work in tandem from one side of strip.

EXPANDING ITS USUAL ROLE of designer and planner to include construction as well, the U. S. Public Roads Administration, under a State Department agreement drawn at the request of the Panama government, is building a modern airport for this Republic neighbor of our Canal Zone. Panamanian contractors are not particularly happy about it, and their feelings are probably shared by some U. S. construction firms, but none can complain that the job has not been well done up to date. PRA got into the

CAREFUL BLADING (below) with Caterpillar grader is part of subgrade preparation. Previously fill, if any, and 18 in. of silt stone subgrade have been compacted with sheepfoot rollers.





**BIG THREE** on Panama National Airport. L. to r. JOHN L. HUMBARD, division engineer; PAUL THOMPSON, project engineer; and A. B. COOK, project superintendent; all of U. S. Public Roads Administration.

PRA Photo



**VIBER VIBRATORS** mounted on rear of Blaw-Knox screed reduce  $1\frac{1}{2}$ -in. slump concrete to finishing consistency.

t supply  
PRA Photo

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construction business by building the Isthmian Highway, and is using the same equipment on the airport.

After moving more than 3,000,000 cu.yd. of red clay for cut and fill and placing 220,000 cu.yd. of silt stone, a shale-like material, for runway and taxiway subgrade, the PRA has been laying down the concrete paving at a rate of more than an acre a day. The total surface to be paved is 472,000 sq.yd. for which 143,000 cu.yd. of concrete is required—12 in. thick in taxiways, aprons and runway end zones, 10½ in. in the runways, 9

in. in roads and 8 in. in automobile parking areas.

Key to this fast paving achievement, under which nine 20-ft. strips of runway 7,000 ft. long were laid in the first 27 days of operations, is a train of big equipment, coordinated with a labor force supervised by U. S. foremen and squad bosses. Two pavers are used, sometimes in tandem, sometimes on opposite sides of the 20-ft. strip in which the paving is built. One of these is a 34E Koehring double-drum, and it is supplemented either by a 34E Multifoote single drum or a 27E Ransome.

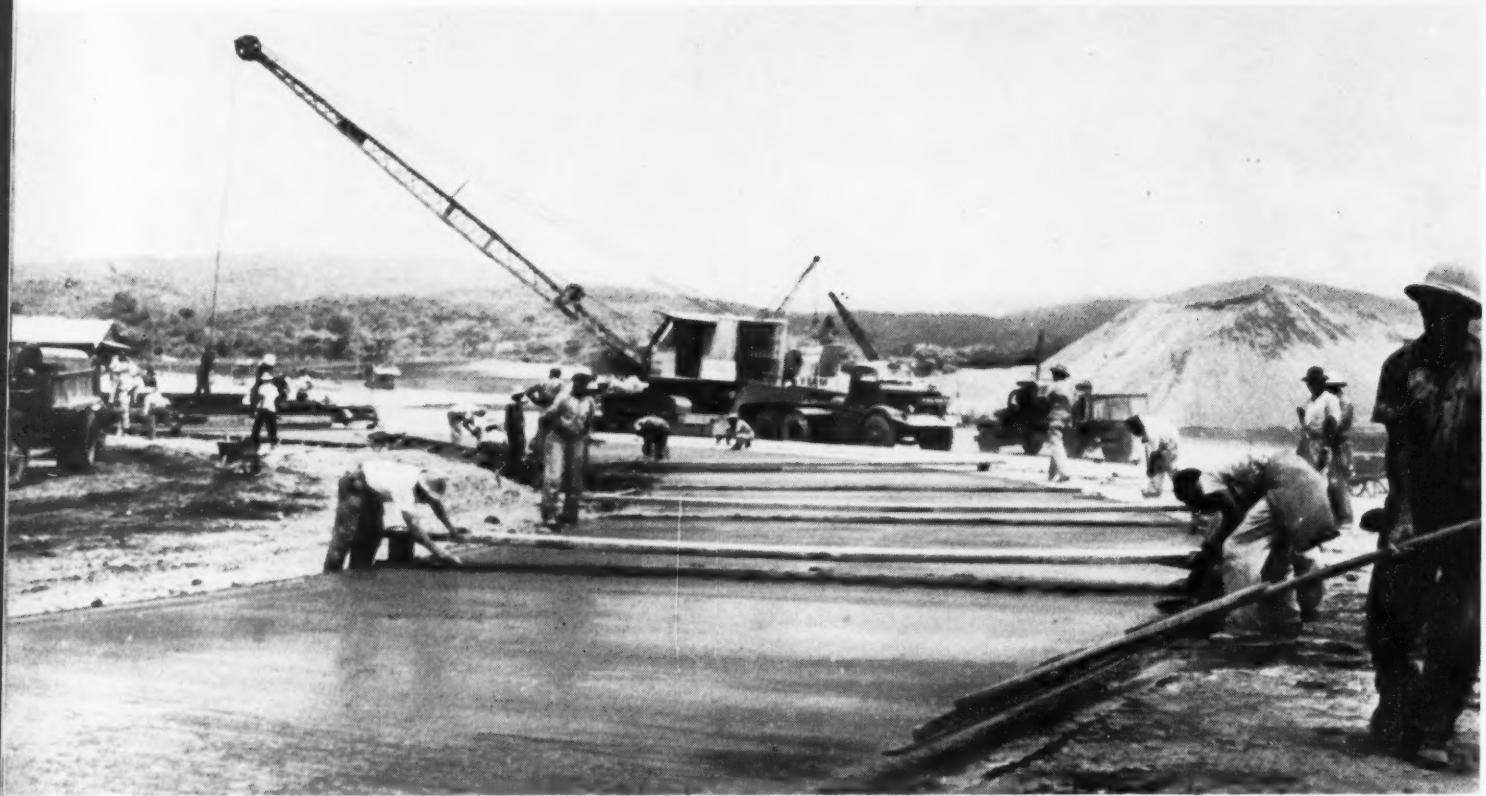
Behind the pavers is a Blaw-Knox longitudinal screed upon the rear of which six vertical Viber vibrators are mounted. This is followed by a Jaeger-Lakewood finisher, and it in turn by a longitudinal dummy joint installer made by the Flexible Road Joint Machine Co.

Wood float finishing, followed by careful hand troweling at all expansion, contraction and dummy

**LAST MECHANICAL OPERATION** is installation of felt dummy joint (below) along centerline of each 20-ft. strip by Flexible Road Joint machine.

**IRONING OUT RIDGES** (below) left by vibrators. Jaeger-Lakewood finisher smooths concrete to form height.





FINAL FINISHING OF SURFACE is done with hand-operated wood float, while trowel work smooths and edges joints.

joints, completes the operations except for the application of Sealcrete curing compound. This is applied by a spray machine operated by an Electric Tamper and Equipment Co. compressor. An interesting kink to this spraying operation is the adaptation of a Flex Joint Machine to service as a "bridge"

for the gun operator. By mounting a canvas enclosure across the front of the machine, the operator can direct the gun on the pavement within the enclosure, which keeps the spray from blowing away in the constant winds.

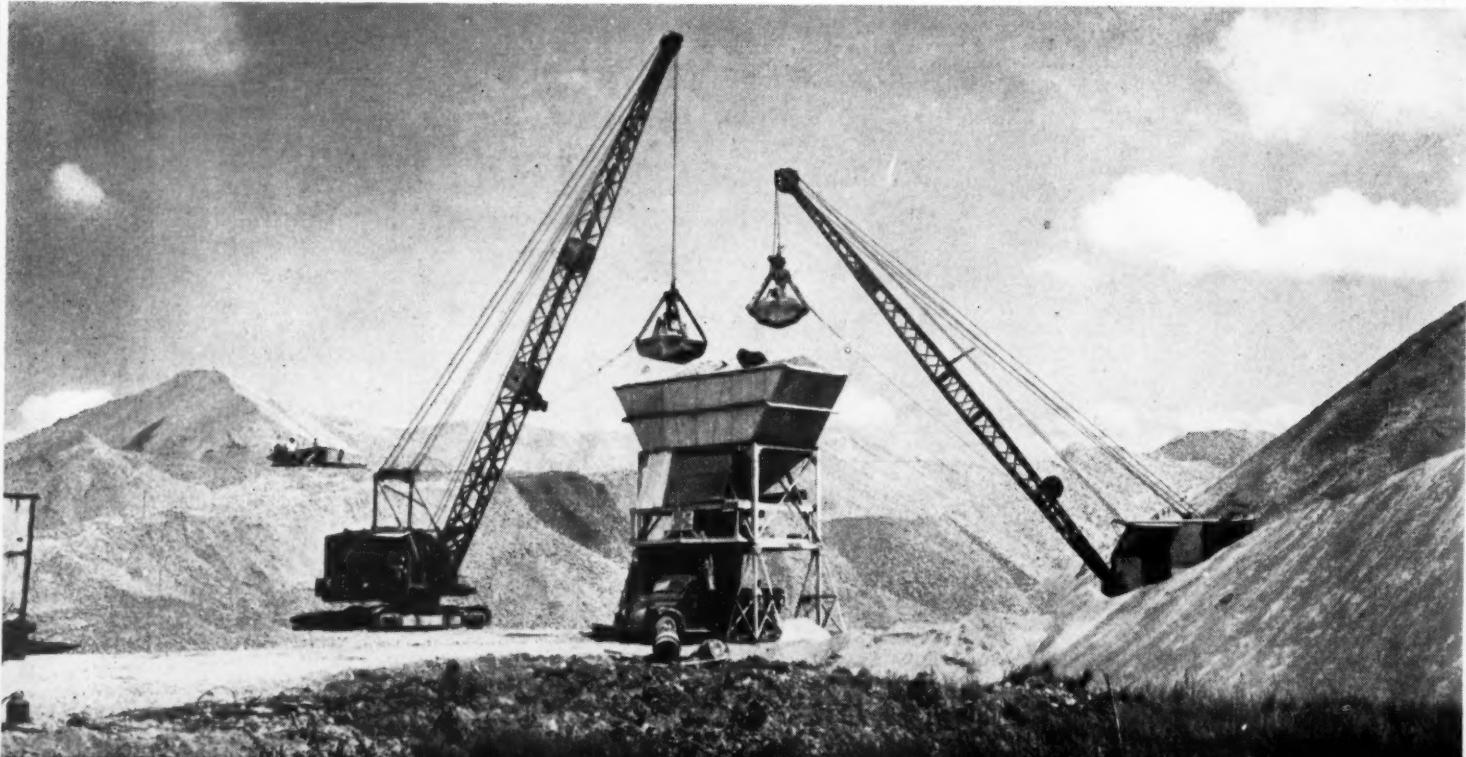
The pavers are charged with aggregates by batch trucks loaded at

a batching plant whose hoppers are kept filled by the clamshell buckets of crawler cranes from stock piles of washed and screened river gravel. Loaded with aggregates the trucks next stop at a warehouse to receive cement in paper bags, which is emptied by workers on an elevated platform

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AGGREGATES from mountainous piles of screened river gravel are clammed into batcher (below) under which trucks are loaded.

PRA Photo





ELEVATED PLATFORM on skids is operating headquarters of workmen who open bags of cement that have been loaded on batch at warehouse.



REPAIR AND MAINTENANCE shops adjacent to work are constantly busy keeping equipment in good running order.  
PRA Photo

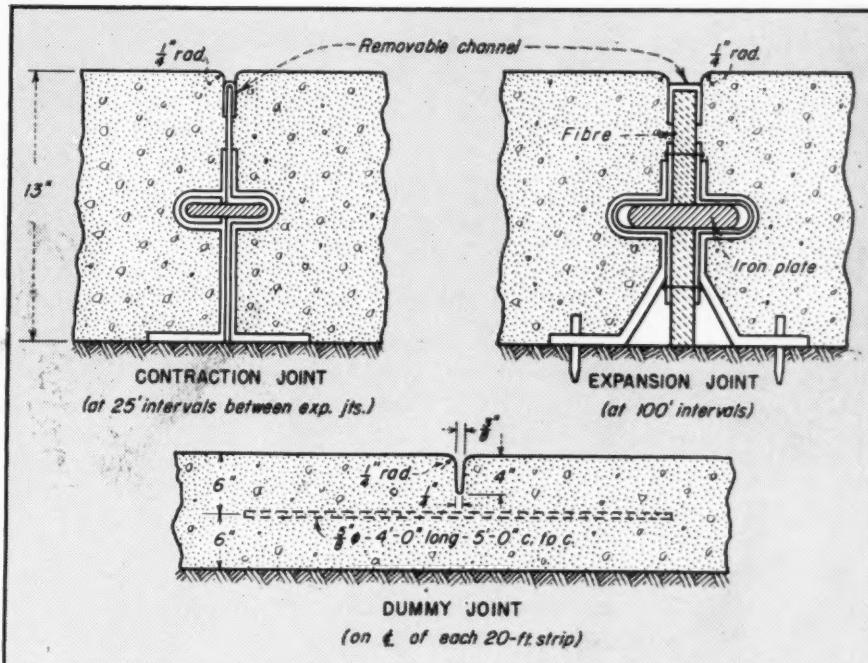
mounted on skids and located near the pavers. Water for the concrete is supplied the pavers through hose from tank trucks.

The success of the operation rests in keeping all of this equipment in good running order (to which end the PRA operates a large maintenance and repair shop), and in imbuing the workers with a desire to work it fast and efficiently.

Paving is scheduled to be completed in June, but not until the various buildings are built will this new airport, located 17 mi. northeast of Panama City, be a going concern. It is estimated that these latter facilities can be ready by Jan. 1, 1949.

For the PRA the work is under the direct supervision of John L. Humbard, division engineer; Paul Thompson, project engineer; A. B. Cook, project superintendent; and Guy Davant, paving superintendent. F. Hulse is acting airport engineer for the Panama Ministry of Public Works of which Octavio Vallarino is Minister.

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TYPES OF JOINTS required in 472,000 sq. yd. of pavement used on Panama National Airport. Steel plates transfer loads across contraction and expansion joints.

CURING COMPOUND, Sealcrete, is sprayed on pavement (below) within wind-protecting canvas enclosure mounted on Flex Joint machine used as bridge. Spray truck and compressor are mounted on 4-wheel cart.





145-FT. BOOM on Lima crawler crane delivers concrete in 1-cu. yd. bucket to tops of 11- and 12-story buildings forming John Lovejoy Elliott housing project at 27th St. and 10th Ave., New York City, first of N. Y. City Housing Authority's developments to get started after war. Group of structures being built by H. R. H. Construction Co., under \$2,747,345 contract, will provide 608 apartments. Feature of design is use of cavity walls for 12-story heights. Foundations were built by Corbett Construction Co. under \$208,300 contract.

GENISSIAT DAM (below) in France nears completion. It is part of construction program to provide industrial power for Lyon and southeast France. British Combine Photo

## THIS MONTH'S NEWS REEL



NOT A SIEGE GUN but a giant concrete mixer of unique design, with capacity of 7 cu. yd. is this new unit of equipment developed by R. G. LeTourneau, Inc., Peoria, Ill., for use with its Tournamixer for monolithic concrete house construction and also for mass concrete placement on other types of construction. It can discharge at height of 20 ft., thus eliminating need for chutes or hoisting equipment. Drum rotation is reversible, one direction being used for mixing and other for discharge by corkscrew action. Swing frame supports cradle in which drum rotates. Elongated drum, which may be charged either through open end or through pair of manholes at lower end, contains helical blades and is rotated by direct-connected electric motor, eliminating use of chains or belts. Tournamixer weighs 15 tons and is 9 ft. wide and 45 ft. long.





**MISS DAMSITE** was appropriate title bestowed upon screen star Janis Paige who acted as mistress of ground-breaking ceremonies April 15 at McNary Dam on the Columbia in Washington. When their blood pressure gets back to normal, crews of Guy F. Atkinson Co., San Francisco contractor, will start work on navigation locks and approaches on big project being built under direction of Portland District, U. S. Corps of Engineers.

Press Association Photo



**ROME SUBWAY** is constructed against background of ancient Coliseum. It is designed to run from central railway terminal in Rome beneath Esquiline and Quirinal Hills to Piazza Venezia, to Coliseum and then to St. Paul's gate, where it will emerge from tunnel and connect with existing surface electric railway line to Ostia on Tyrrhenian Sea.

Press Assn. Photo

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**CONSTRUCTION CREWS** work on The Big Cut, deepest part of east section of new 21-mi. canal near Caldwell, Ida., Bureau of Reclamation project to irrigate 25,000 acres of new land. Big cut will be 5,200 ft. long and have depth ranging from 78 ft. to 10-ft. average. Water for project will be stored in Cascade Dam, now under construction near Cascade, Ida. Marshall & Haas Co., San Mateo, Calif., has canal job.

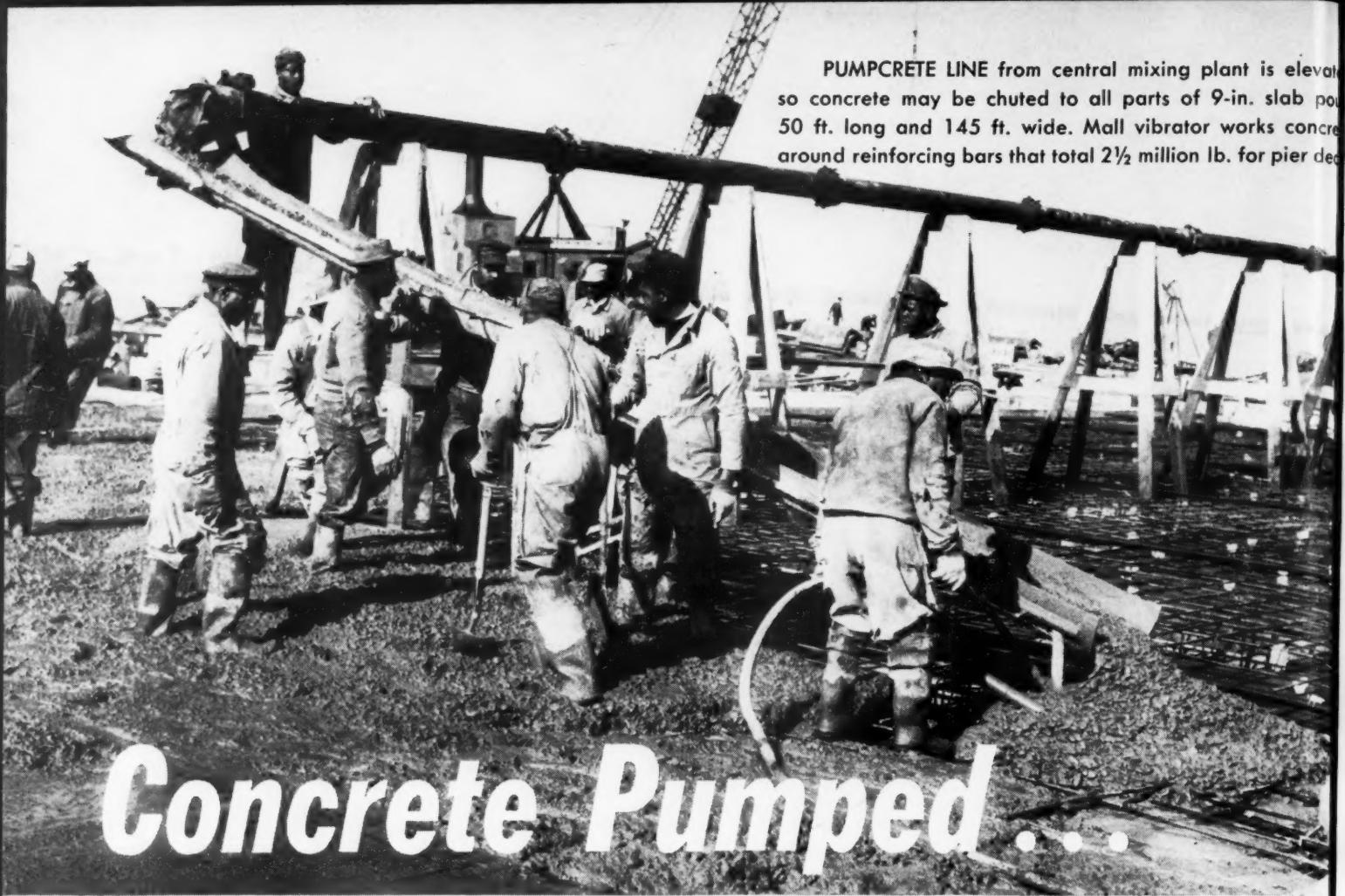
**TRACTOR SIDEBOOM CRANE** (below), pulled off pipelaying job, removes wreckage after Texas City, Tex., blast in search for injured and dead.

Press Assn. Photo



**PRECAST HOUSING** (below) for United Nations personnel is under construction on Long Island in New York City. Concrete slabs cast in concrete forms are handled by lifting with vacuum-held device. Casting is done as weather conditions permit and slabs are transferred promptly to point of use. Precasting features were developed by E. H. Praeger of Madigan-Hyland, consulting engineers for project. General contractor is George A. Fuller Co., New York, and lifters were developed by Vacuum Concrete, Inc.





PUMPCRETE LINE from central mixing plant is elevated so concrete may be chuted to all parts of 9-in. slab 50 ft. long and 145 ft. wide. Mall vibrator works concrete around reinforcing bars that total 2½ million lb. for pier deck

# Concrete Pumped....

for 70 Miles of Precast Piles and 10-Acre Pier Deck

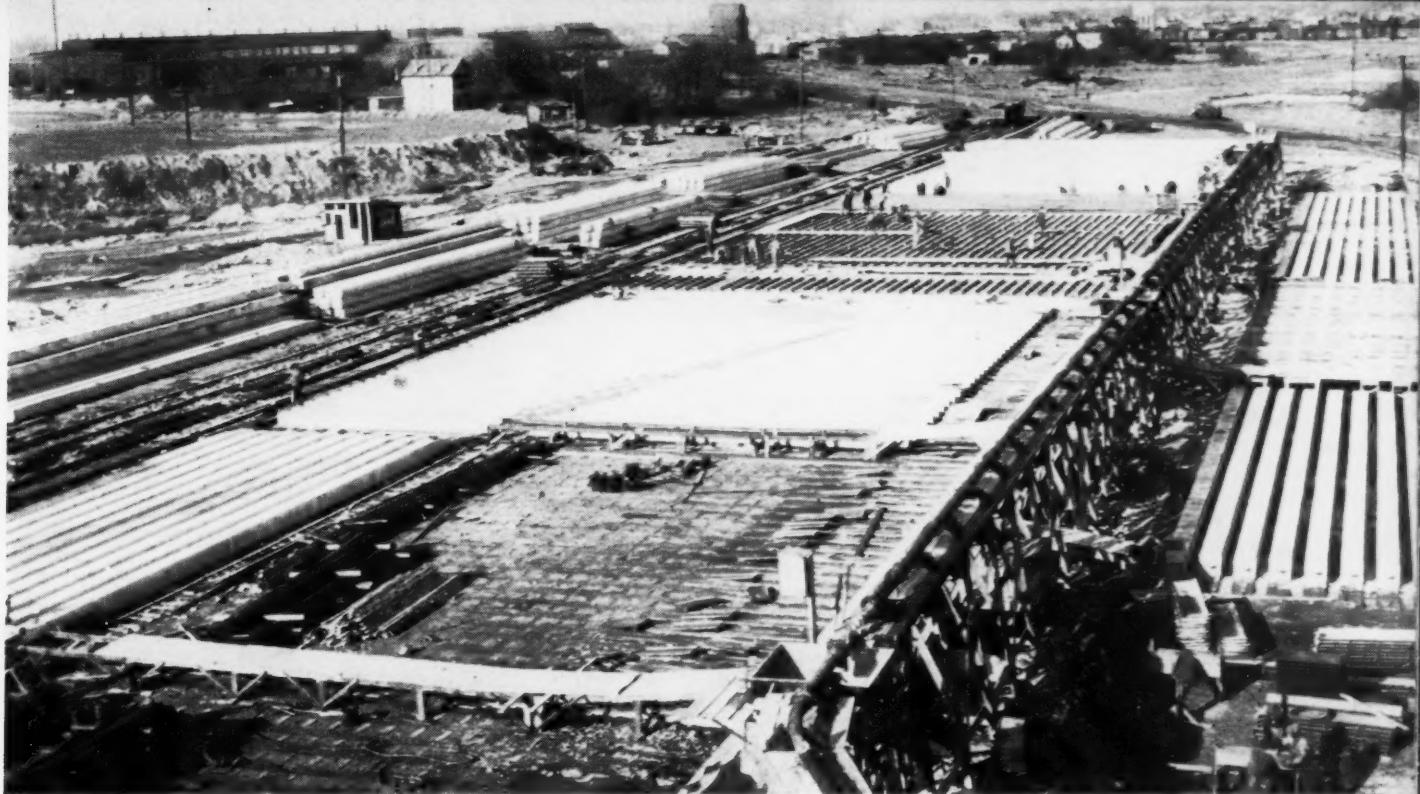


TO SPEED CONSTRUCTION of a huge pier for the Norfolk & Western Railway at Norfolk, Va., McLean Contracting Co. devised economical, easily erected forms in which they are precasting 5,400 piles, and built simple templates that align and hold eight or more piles at once for fast driving. Piles are 18 and 20 in. sq., 50 to 80 ft. long, and weigh up to 17 tons. Pile forms are wedged in position to eliminate all erection nailing, and have the excellent average life of 65 uses—an important factor in economically forming up 1½ million sq. ft. for almost 70 mi. of pile.

The pier, which will augment existing facilities at the railway's Lambert Point terminal on the Elizabeth River, will be 390 ft. wide and 1,100 ft. long, supporting a 319x1,050-ft. steel frame storage warehouse. Aprons on either side of the warehouse will each carry two lines of railroad track as well as one rail for semi-gantry revolving cranes. Two lines of depressed track will run along the pier centerline. As shown on an accompanying drawing, piles are on 10-ft. centers under the slab sections of the pier deck, and in bents on a 20-ft. spacing beneath aprons and centerline track. All concrete for piles

MIXING PLANT consists of Blaw-Knox batcher, two Koehring mixers and Rex Pumcrete machine. Auxiliary 300-bbl. cement bin augments plant's 100-bbl. supply. Gasoline hoist hauls bulk cement cars to unloading hump at plant, and empties coast off unaided, to eliminate use of switch engine.

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n. slab po  
works concr  
or pier de



5,400 CONCRETE PILES for pier are precast in yard served by trestled Pumpcrete line from central mixing plant. Piles are 18 and 20 in. sq. and total 70 mi. in length.

and deck is delivered by a dual Pumpcrete machine.

McLean set up a pile yard adjacent to the pier site, and is pre-casting 3,450 piles 18 in. sq. and 1,950 piles 20 in. sq., both sections tapering in the bottom 4 ft. to an 8-in. wide blunt chisel point. Piles are reinforced with eight 1-in. round bars and  $\frac{1}{4}$ -in. hoops preassembled into cages on ingenious steel spacers that hold the longitudinal rods in place for tying. The spacer is U-shaped and has one upright pinned at the base so that it may be swung flat for removal of the tied cage. Pile reinforcing totals 4,100 tons.

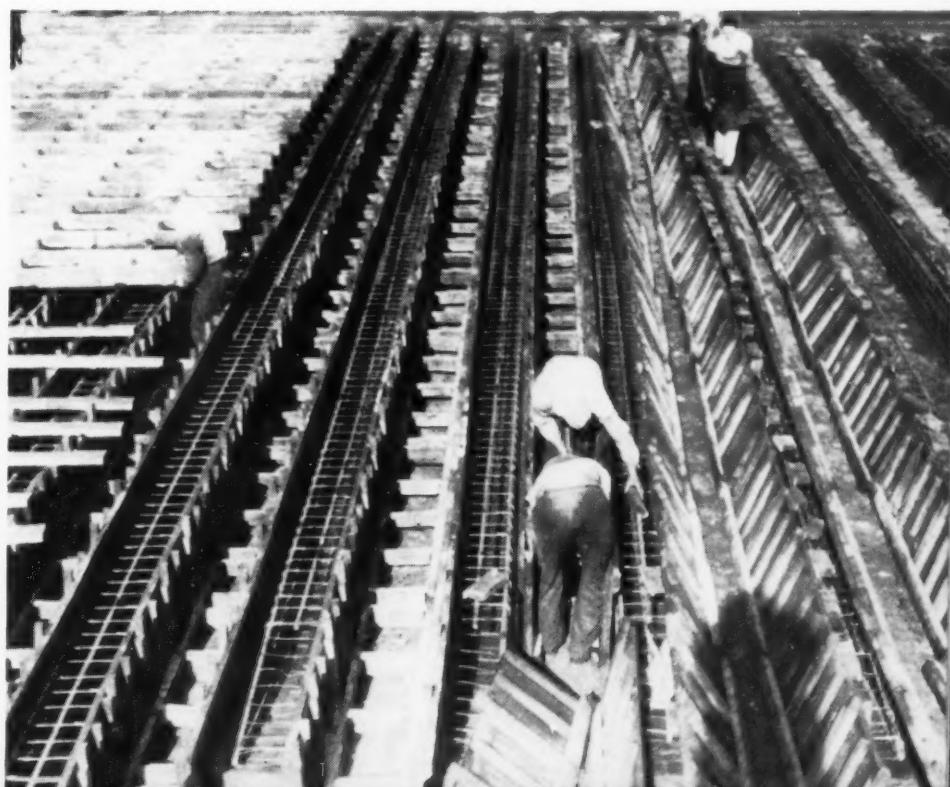
Piles are cast on 2-in. tongue-and-groove timber pallets, with side forms of 14-gage black iron sheets screwed and bolted to frames of 2x2- and 2x4-in. stock. To form  $1\frac{1}{2}$ -in. chamfered corners on the piles, wood strips are built into the form frame, and the top and bottom of the metal sheets are bent around them. Form panels are made in 8-ft. lengths for easy handling. Pallets are the exact width of the piles, and are set equally distant from each other

resting on 2x6's on 3x4 stakes that raise them slightly above ground level. This permits the bottoms of the side form panels to be blocked against the pallet edges by simply wedging pre-cut spacer blocks between them and the forms of the next pile. The tops of the forms are braced to those of adjacent piles by 2x6-in. timbers on edge, with the bottoms of the 2x6's notched to fit over the form frames. The timbers span and brace forms

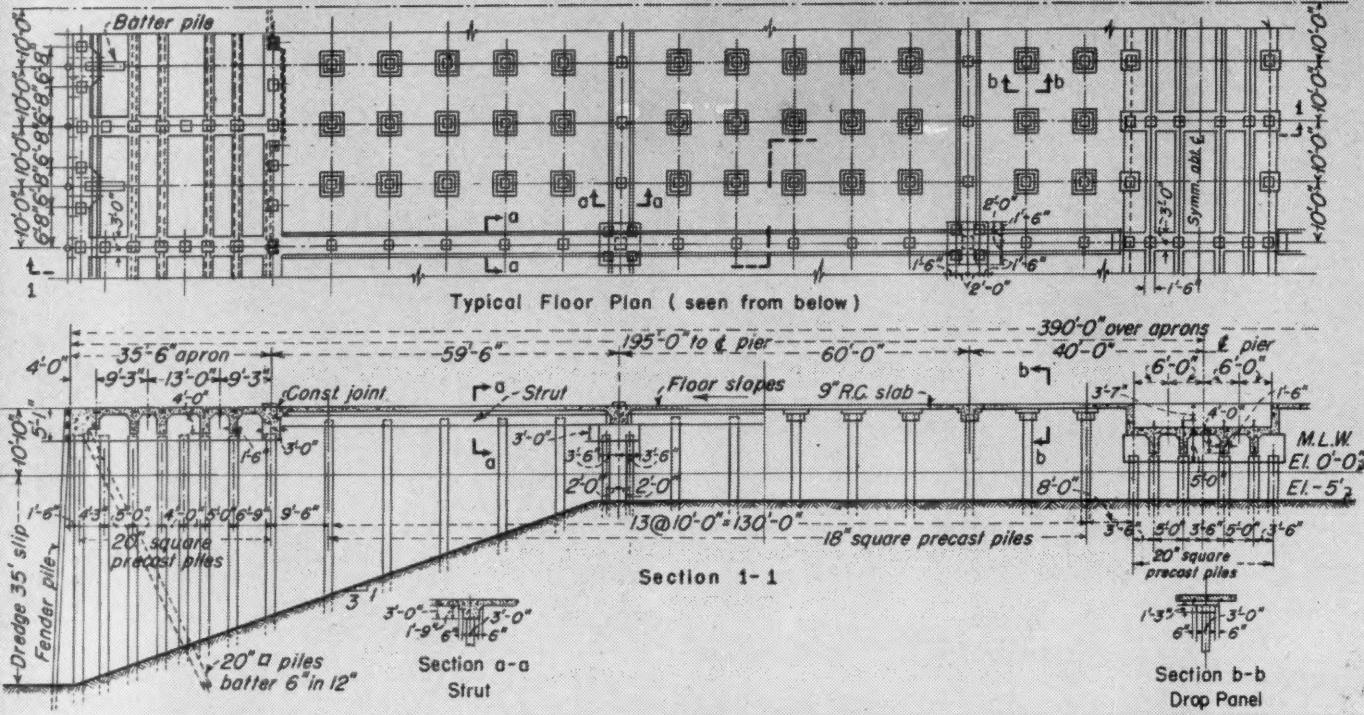
for a group of five piles, and are on 2-ft. centers. Since the forms are wedged at the bottom and are spaced by the notched boards at the top, all nailing in connection with erection, and consequent damage during stripping, is eliminated. As a result, form life averages 65 uses.

Concrete for piles totals 32,000 cu. yd. and is mixed in a central plant midway between casting yard and pier. Two Koehring 34-E

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SIMPLE PILE FORMS of 14-gage metal on wood frames are positioned without nailing to insure long form life, which averages 65 uses. Pre-cut spacer blocks wedge panel bottoms, while notched boards, left, brace tops.



HUGE CONCRETE PIER for Norfolk & Western Railway Co. at Norfolk, Va., is 390 ft. wide by 1,100 ft. long with 319x1.050-ft. steel frame warehouse. Structure is being built by McLean Contracting Co., Baltimore.



LEVERED JACK (below) lifts pile reinforcing cage for suspension by hooks from notched form spacers. Cages are rested on pallets before forms are erected.



dual-drum mixers feed a Rex 200-double Pumpcrete machine that pumps concrete through an 8-in. pipe to the pile yard for buggy distribution to the forms. Pile concrete is a 4,000-lb. AA mix, roughly 1:2:3, with  $5\frac{1}{2}$  gal. of water per sack of cement, and a 2-in. slump. To increase the concrete's workability and durability, 1 lb. of Pozzolith is added for each bag of cement. A  $1\frac{1}{4}$ -yd. batch contains 2,430 lb. of stone, 1,560 lb. of sand, 823 lb. of cement, 4.37 gal. of Pozzolith slurry and 27 gal. of water, and is mixed a total of 3 min. Plant output is 50 yd. per hr., and 85 piles 60 ft. long have been cast in one 8-hr. day.

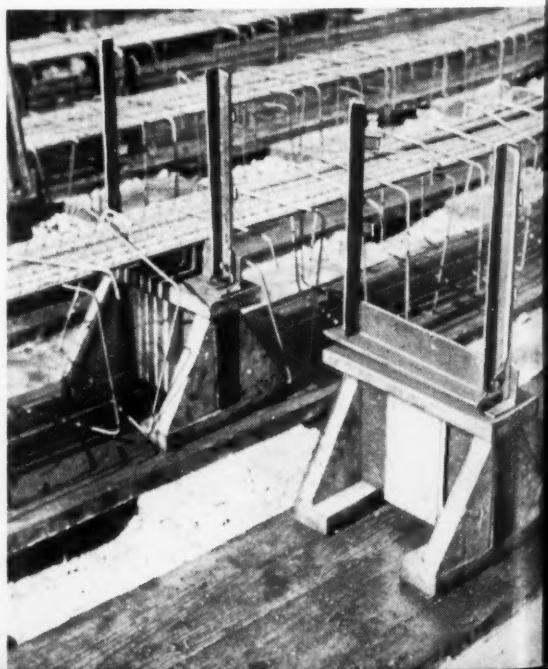
After finishing, piles are sprayed with a compound, then stripped and left on the pallets for 7 days

**CONSTRUCTION OF PIER AND WAREHOUSE** is directed by GROVER C. DENNY (center), McLean Contracting Co.'s general superintendent on the project, and W. I. KING (second from right), resident engineer for Norfolk and Western Railway. Others are (l. to r.): H. A. CAMPBELL, general carpenter foreman; L. J. HARTMAN, superintendent; and F. J. MORRISON, engineer; all of McLean's staff.

before being moved to storage for an additional 7-day cure. Piles are handled by locomotive crane through a steel beam strongback with adjustable yoke clamps that may be slid along the beam to the lift points of various length piles.

Piles are delivered by barge to the driving rigs, two barge-mounted 25-ton Wiley Whirleys with 85-ft. booms. To position the piles for driving, McLean uses trussed steel-beam templates—an old standby on their many pile

**PILE REINFORCING** (below) is assembled on spacer jigs with pivoted arm that swings down for removal of device from beneath tied cage. Wooden chairs raise assembly to convenient working height.





**LOCOMOTIVE CRANE** and steel beam strongback load pile on flatcar for delivery to transfer barge. Steel frame added to standard car gives adequate support to heavy piles up to 80 ft. long.



**LIFTING YOKES** on strongback are toed in at bottom to fit around chamfered corner of pile. Yokes are slid along beam to lift points of various length piles and are clamped by bolt between vertical legs.

jobs. The templates on the N.&W. project are two trussed 14-in. H-sections up to 98 ft. long set side by side and spaced to little more than pile width by bolted angle irons. The angles are located to form pockets through which piles are threaded to put them on correct alignment. Template ends are supported either by steel spud piles or by previously-driven concrete pier piles. Three templates space all piles. One template spaces piles under the center tracks and in two lines on either side, a second locates the next eight pile lines including piles for

column foundations, and a third spaces the remaining slab piles as well as those beneath the apron. Driving proceeds in that order—with each section carried ahead about 10 bents before the adjacent section is driven.

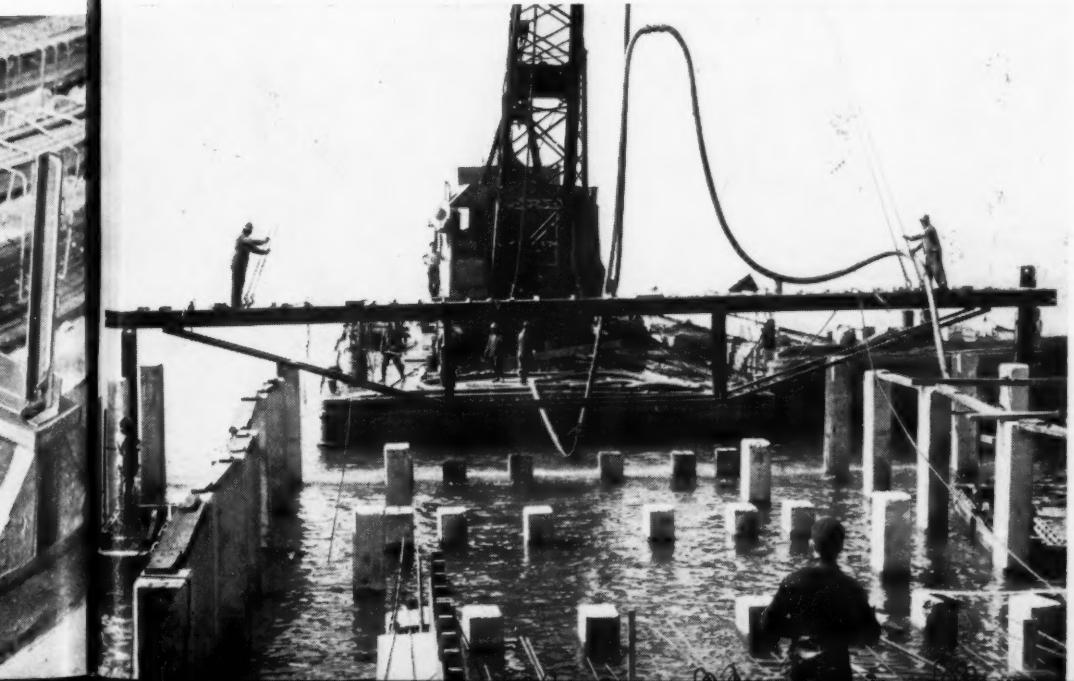
With template aligned, all piles to be driven in that portion of the bent are set up in the template pockets, after which they are jetted to within 2 ft. of grade. A shore-mounted LeCourtney 3-stage centrifugal pump, driven by a 300-hp. G.E. motor and rated 1,250 gpm. at 450-lb. pressure, delivers water through an 8-in. line

to a 1½-in. nozzle on the jet pipe. When all piles have been jetted, a McKiernan-Terry single-acting hammer with 7,500-lb. ram and 48-in. stroke drives them to 50-ton bearing (¼ in. per blow). As the template, once spotted, insures

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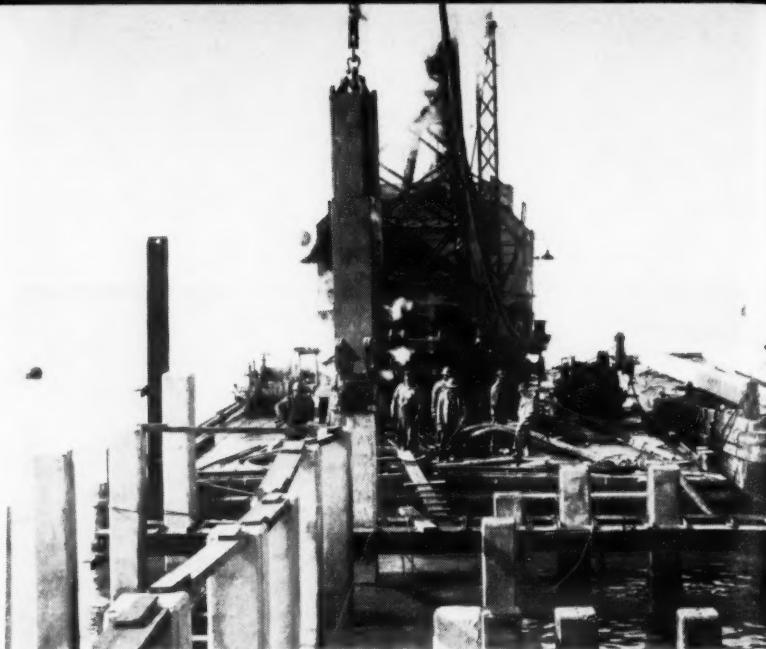
**BARGE-MOUNTED CRANE** (below) lifts pile to vertical position to slip it through pocket before jetting and driving series of piles to grade. Steel pile spud supports template end, which is pinned at correct elevation to spud's perforated flanges.

**PILEDRIVING TEMPLATE** (below) is pair of trussed beams with pockets through which piles are placed to align and hold them during driving. Here Wiley Whirley moves template ahead in preparation for driving group of eight piles in next bent.





**JOB-BUILT DERRICK** on pier edge lifts stripped formwork and framing from water for re-use. Air-operated tucker hoist powers rig that is counterweighted with job tool box.



**AFTER JETTING.** McKiernan-Terry S10 hammer drives piles to grade. Pile head is cushioned by 4-in. laminated gumwood block.

almost perfect alignment for eight or more piles at once, and since by holding a group of piles it eliminates many rig changes from sling, to jet, to hammer and back, excellent driving progress is made. Two rigs have put down as many as 54 piles 75 ft. long in 8 hr.

The pier deck is a 9-in. concrete slab and 1-in. bituminous wearing surface, with drop panels at pile heads and 7-ft. square footings at warehouse columns. Deep concrete girders and beams support center tracks and aprons. The deck is constructed in five stages across the width of the pier. The central track section is poured first, followed in turn by the south apron, the south slab, the north apron, and the north slab. Slab

pours are 50 ft. long, the others 100 ft.

Slab forms are 5x10-ft. longitudinal panels of  $\frac{3}{4}$ -in. sheathing on 2x6 joists 16 in. o.c. Panels rest on 6x6- and 4x6-in. transverse stringers on 6x10-in. girders parallel to the pier centerline. Girders are posted to 8x12-in. transverse clamps which in turn rest on short 8x12-in. toggles. Toggles and clamps are bolted around the piles, and friction support is augmented by hangers from the pile tops. Hangers, which are usually on alternate pile lines, are threaded  $\frac{7}{8}$ -in. rods bolted through the toggles and suspended from 3- or 4-in. doubled channel saddles.

Formwork for the track and

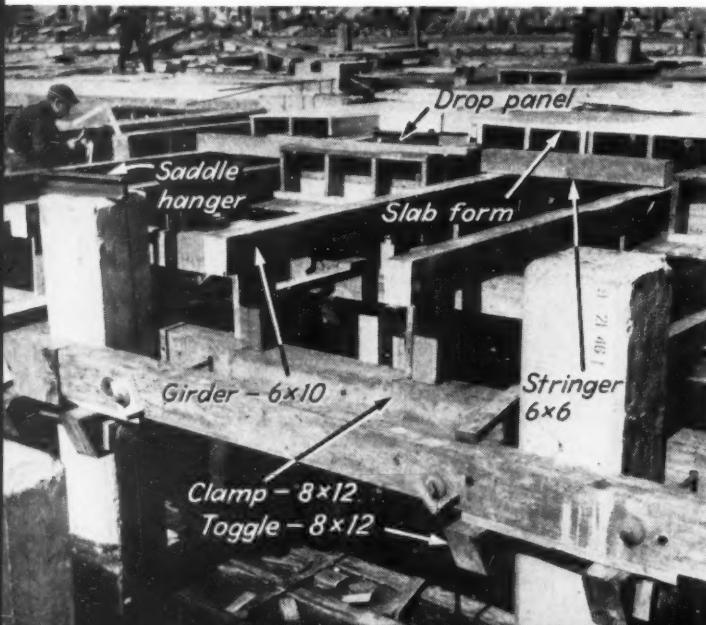
apron sections is somewhat similar; with  $1\frac{1}{4}$ -in. rod hangers, 8x12-in. toggles, 12x12-in. clamps and doubled 8x16-in. longitudinal stringers supporting track beam forms. The forms themselves are generally culvert shaped—forming one side of two adjacent beams and the intervening slab—built up of  $\frac{3}{4}$ -in. sheathing on 2x6 studs and joists on 20-in. centers.

Form supporting timber averages 100,000 b. ft. for each 100 lin. ft. of pier, and formwork for the pier totals 900,000 sq. ft.

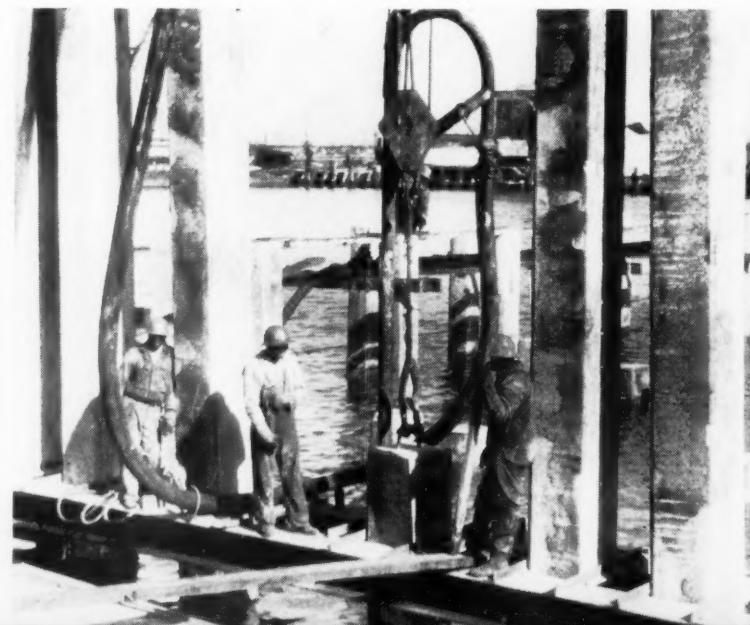
Clamps and other heavy timbers are set by barge-mounted crane, the remainder are placed by hand. Forms are stripped by workmen on rafts unbolting the

(Continued on page 168)

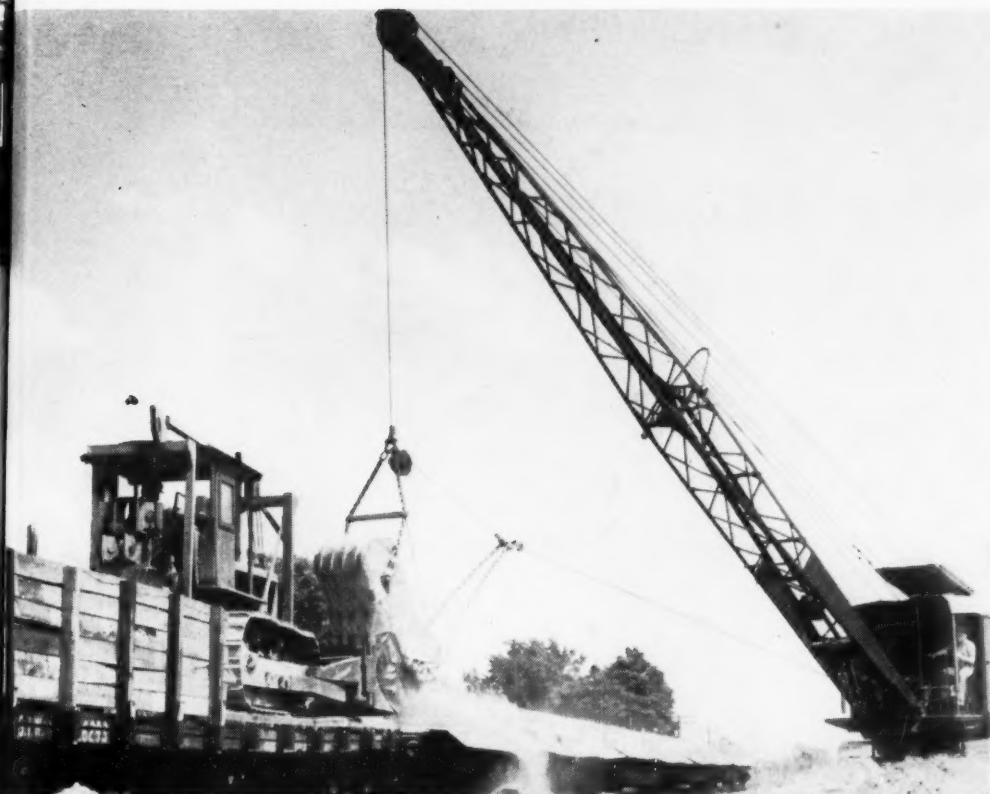
**FORMS FOR PIER DECK** (below) total 900,000 sq. ft. and rest on built-up framework of heavy timber that amounts to 100,000 b. ft. for each 100-ft. length of pier.



**PILES ARE JETTED** (below) to within 2 ft. of grade after template is aligned and filled with piles. Shore-mounted pump furnishes water through 8-in. line to  $1\frac{1}{2}$ -in. jet nozzle.



# Bulldozer Unloads Fill From Revamped Railroad Flatcars



EXCAVATED MATERIAL from railroad cut is loaded on flatcars by 1½-yd. dragline. Tractor-bulldozer rides work train.



DECK UNLOADER in form of tractor-bulldozer spills fill material for railroad grade from flatcars equipped with hinged aprons which clear rail by 52 in.

RAILROAD FLATCARS unloaded by a tractor-bulldozer took the place of conventional dump cars in transporting material from cut to fill on a right-of-way grading contract of Hamer Brothers, Inc., Detroit, for the Grand Trunk Western R. R. The cars were equipped with wooden sideboards at one edge and a hinged apron at the other. Steel-plate decks and sideboards bridged the gaps between cars to furnish more load-carrying capacity and enable the tractor to operate the full length of the work train. Starting at one end, the bulldozer pushed the fill material off the cars and over the apron, which extended beyond the ends of the ties.

Hamer Brothers revamped the flatcars for the work. An eight-car train could carry an average of 330 cu. yd. This load could be cleared from the decks by the Caterpillar D6 tractor, equipped with a bulldozer, in 20 min. A

1½-yd. dragline loaded the cars. Operating over a stretch of mainline single track which had to be kept clear at times for pas-

sage of trains, the contractor moved as much as 1,000 cu. yd. in a day with the improvised work train.

## Beware of Flying Steel

UNDER THE POIGNANT HEAD-  
ING, "Don't Let Flying Steel Steal  
Your Eyesight," the April issue of  
"Em Kayan", house organ of Mor-  
rison-Knudsen Company, Inc.,  
hands out some mighty sound ad-  
vice in avoiding eye injuries:

"The last thing seen by many  
an eye has been a spare jack-  
hammer shaft smacking a dull  
drill bit to knock it loose . . . or  
a steel-headed hammer socking  
a new track pin into place. And  
in each case a crime has been

committed . . . the crime of using the  
wrong tool. When hard steel  
strikes hard steel, sharp steel  
splinters are apt to fly . . . and  
when steel flies there's peril on  
the wing for workers' eyes. The  
sure cure is simply the matter of  
using the right tool. When loosening  
dull drill bits, use a wrench  
or a soft-headed hammer. In re-  
placing track pins, use a soft  
drift pin. One of the wisest  
safety rules is to use good judg-  
ment in selecting tools."





LIFTING LOOPS of bent 1½-in. square steel bars, to facilitate handling by sling on crawler crane, are made integral part of 7x16-ft. precast concrete slabs, 1 ft. 10½ in. thick, forming roadway of Southern Railway's double-track concrete trestle 480 ft. long across Haw River near Reidsville, N. C. After slabs are set atop pile caps on mortar beds, to insure even bearing, lifting rings are burned off flush with surface of concrete prior to laying of track.

# HOW They Did It

## CONSTRUCTION DETAILS

For  
Superintendents and Foremen

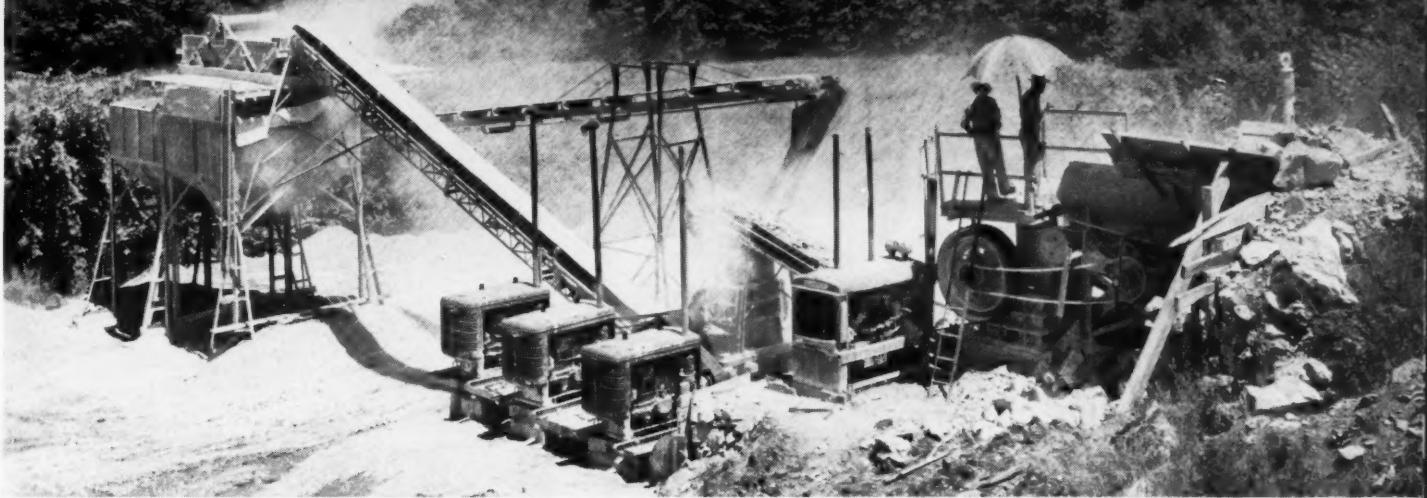


TUNNEL TALK by Teletalk is possible in Philadelphia Electric Co. cable tunnel being driven under Schuylkill River by Dravo Corporation. Here H. C. RICHARDSON, Dravo project manager, listens at bottom of east shaft to message coming from on top through loud speaker.

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THREE-TON WRECKING BALL (below), swung by Lorain shovel powered by Caterpillar diesel engine, demolishes structures in old "Gas House District" in lower East Side of Manhattan where 18 blocks are being cleared to provide housing units for 8,761 families under sponsorship of Metropolitan Life Insurance Co.





**FIVE DIESEL POWER UNITS** operate limestone crushing plant of H.&R. Quarries near Bunceton, Mo. which has rated capacity of 1 ton per min. Three International 100-hp. units, center, are staggered to provide proper alignment of pulleys and belts for triple

drive of Gruendler crusher. A fourth unit, at right, operates Diamond 15x36 primary crusher. Fifth unit, which develops 31½ hp. at 1,800 rpm., operates 4x12-ft. double-deck screen and also 24-in. wide by 60-ft. long conveyor belt. All power units are equipped with high intake pipes to provide cleaner air above dust.



**INJECTION PIPES** for regROUTING roadbed to stabilize track for New York & Long Branch R.R. near Matawan, N. J., driven with air hammer to depths of 7 to 8 ft., below bottoms of ties, and spaced on 5-ft. centers, are readily withdrawn with aid of track jack equipped with special attachment consisting of plate with hole and setscrew to fit over and grip pipe.

FOR HOLDING INJECTION POINT in position when pressure is applied during grouting of tunnel floor on Illinois Central R.R. special tool was devised to act as lever. It consists of pipe length to which two identical triangular plates are welded, one on each side and spaced 1½ in. apart, like tines of a fork. Plates are stiffened by connecting strut. Steel lugs are welded on grout pipe which is straddled by plates on lever tool; tips of plates are wedged under bottom of rail so that grout injection point is held firmly in position when pressure is applied.



**GROUT MIXER** and air-driven grouting pump are mounted together on big semi-trailer that also carries supply of bagged cement. This compact unit was assembled by Boyle Construction Co., Sumter, S. C., for grouting core wall trench under west embankment of Clark Hill Dam, Savannah River project being built by Corps of Engineers. Grout mixer discharges into receiving tank set on ground from which slurry is transferred to pump by suction hose.

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**ON 100-HOUSE DEVELOPMENT** (below) in Richmond, Va., final leveling and grading of site are done by International wheel tractor equipped with Baker bulldozer and Riddell rotary scraper. Contractor for project is Alfred Blake & Sons, Inc., of Richmond.





FROM WEST PORTAL 2,660-ft. tunnel on 16-mi. Pennsylvania Railroad double-track relocation near Conemaugh damsite was driven.

## HALF-MILE TUNNEL DRIVEN



LACK OF STRUCTURAL STEEL RIBS to support the timber-lagging liner for a 2,660-ft. double-track railroad tunnel near the Conemaugh damsite, about 30 mi. east of Pittsburgh, Pa., was not considered sufficiently important to delay its construction. Following the holing through on Dec. 14, 1946, of a 15-ft. square 2,660-ft. long pilot tunnel, which was started July 1 of that year, work was begun on the main bore, at the west portal, using a 5-segment liner of hand-hewn native timber.

By Feb. 1, when the first shipment of steel ribs arrived on the job, 230 ft. of temporary timber liner had been installed; all of it was replaced with the permanent steel and timber liner.

Spacing of the steel ribs, which are 8-in., 27-lb. rolled beams vertical and 8-in., 40-lb. bent beams for the roof, varies from 1 ft. 8 in. to 4 ft. depending on the character of material and load to be supported. Preliminary test borings indicate that no ribs or timber lagging will be required for the 1,010-ft. central portion of the tunnel.

DRILL CARRIAGE is here shown at west portal of main bore which is being enlarged to 36 ft. wide by 32 ft. high, from previously drilled pilot tunnel 15 ft. square.



JOSEPH J. CARLOTTA, tunnel superintendent, (right) stops along-  
side a 13-cu. yd. Euclid truck for quick "shot" with MIDDLE T.  
TURCOTE, surface superintendent.



TEMPORARY TIMBER shoring just inside of west portal protects  
workmen from falling rock until permanent steel-and-timber  
lining can be installed.

## EN FOR P. R.R. DOUBLE-TRACK LINE

Herman Holmes, Crystal Falls, Mich., is the contractor. Joseph J. Carlotta is superintendent of tunnel construction, James J. Ryan is tunnel foreman, and M. T. Turcote is surface superintendent. Construction of the tunnel is part of a 16-mi. Pennsylvania Railroad relocation being built preparatory to the construction of Conemaugh Dam.

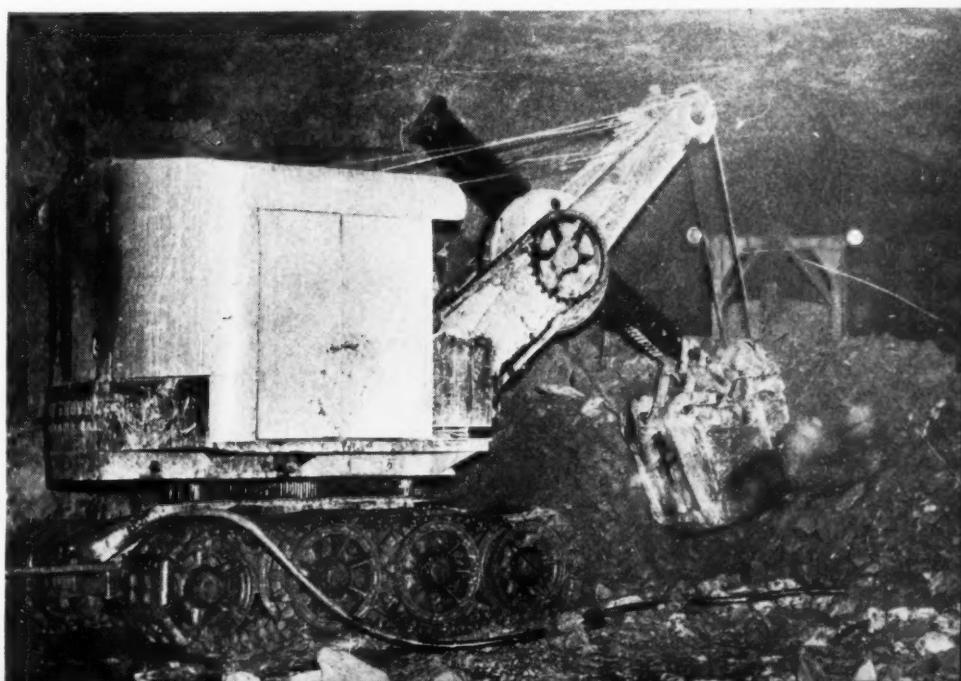
The entire project is being built for the Corps of Engineers, U. S. Army, under the jurisdiction of Col. W. E. Lorence, Pittsburgh District Engineer. Donald D. Rait is the resident engineer.

Plans called for the reinforced-concrete lined tunnel to have a clear width of 30 ft. for two lines of railroad track at 14 ft. c. to c.

Side walls are vertical with spring line 15 ft. 7 in. above base of rail. The circular roof has a 22-ft. inside radius. Walls and roof are 2 ft., 2 in. minimum thickness plus an allowable 6 in. overrun to the

payment line for tunnel excavation and concrete lining. Tunnel floor is 18 in. thick.

*Large Main Bore*—These generous tunnel dimensions, requiring a bore  
(Continued on page 170)



MUCKING IN THE MAIN BORE is done by 1 1/4-cu. yd. electric Lorain shovel, assisted by a Caterpillar D-7 bulldozer operating in pilot tunnel.

# WORLD LEADERSHIP...

## Our Duty and Our Opportunity

CAPITALISM in Europe and the rest of the world is challenged by a real and formidable rival, communism. For capitalism to thrive a reasonable amount of prosperity is essential. Communism uses poverty to advance itself.

Except for the Western Hemisphere, most of the world came out of the war poor. Two years after V-E Day it is still poor. It needs dollars. It needs credit. It needs capital. It needs trade. It needs technical and managerial skills.

If we in America are to help the rest of the world back to its feet, starting it again on the road to peace and a free economy, we should try to supply those needs within the limits of our capacity.

We must not overtax our own strength. For the first requirement of a stable world is a strong United States. But we must accept leadership in international economic recovery—in our own self-interest.

What can the United States do to help men back to prosperity in a world economy which will allow them *freedom and incentive*? There are many things. But here are two of the most important:

1. The United States, through Congress, must determine the pattern and the total of the foreign loans or grants it can afford. We must answer three questions. How much will the new program cost? Can we afford it? Have we the technicians and managers to watch the loans, assuring their fruitful use?
2. We must demonstrate that we do not intend to raise our tariff walls to prohibitive heights when our debtors begin to repay us in goods and services, which is the only practical way they can pay us. Otherwise our loans will become losses.

If the United States is to meet even the minimum requirements of world rehabilitation, Congress eventually must authorize more advances than those to Greece and Turkey. The \$400 million for those two countries will not do the over-all job of political and economic defense which we have begun. A min-

imum of \$5 billion, if promptly and wisely applied in eight to ten countries, might suffice. BUT this \$5 billion will be on top of approximately \$16.8 billion which we have spent or earmarked during the past two years for use abroad, including our full share of the World Bank and Fund. We shall do a faster and more effective job if Congress will thus add up the foreseeable total of our international aid, and, even though the total looks impossibly large, commit us to it, with proper collateral safeguards from the debtor nations.

Congress need not try to foretell all contingencies, like last winter's weather in Britain, and it certainly should not create the impression that nations need only ask for billions to receive them. On the other hand, the war should have taught us the miserable consequences of "too little and too late." The President should have learned that he engenders skepticism by going to Congress with parts of a program, as he has done in the British, Grecian and Turkish loans. Within the limits of our capacity, we must make the decision now to see the whole job through—or throw in the sponge.

In the interest of the debtor nations—as well as in our own interest—the loan program should be hard-boiled. Rehabilitation loans must really rehabilitate. They must produce a state of economic health which will permit the World Bank and private capital to take over the task of financing world recovery—as perhaps can be done today in France and the Low Countries.

The loans, therefore, must be within the limits of our technical and managerial ability to implement them. Without technical help, Greece can not use its loan effectively—to rebuild railroads, clear ports, revive agriculture. Without skilled supervisors, Germany can not be made to pay its way. Money alone won't pull China from the brink of economic chaos.

Our lending calls for more than money. It calls for trained personnel to help the recipients utilize the loans effectively—geologists, construction and sanitary engineers, monetary experts, and management and agricultural specialists.

Loans are necessary but they are only a first step. A long-range program requires the opening of the half-closed doors of world trade—our own door, too.

We will have to get used to the idea that, when our debtors pay us, they must pay us largely in goods and services. Refusal to permit such repayments in the twenties helped start the world depression in the thirties—and the loss of our investments. *Imports do tend to raise living standards, and a two-way trade program need not require us to slash our present tariff rates.*

The complexion of our foreign trade has changed since the war. Our manufacturing capacity has increased and our raw-material self-sufficiency is tending to decline. For example, we probably shall have to continue importing copper and zinc and to increase our prewar dependence on imported lead. We may soon have to depend heavily on imported oil, and—gradually—on a growing volume of iron ore from abroad. Our normal dependence on imports for commodities like rubber, tin and silk will continue.

Our population has gone up 10 million in the last decade, and we now have a \$176 billion national income, making room for more imports.

As a result of every nation's recent attempts to make itself secure and self-sufficient by slamming its trade door, a world-wide series of quotas and restrictions is blocking international trade. Even more, government buying and selling threaten to take commerce out of the hands of private traders, placing it in the uninspired care of bureaucratic negotiators.

Our government has taken the lead in calling the conference of 18 nations, now meeting at Geneva, to open as many trade doors as possible. The American delegates will bargain product by product and country by country—all summer, if necessary—for

lower tariffs, fewer quotas and a free flow of private trade. The task is a long one, and the results are as yet uncertain, but, if success is achieved, an immense opportunity for good works and good earnings will lie before American businessmen.

This is no picayunish opportunity. Authoritative estimates put our 1947 exports at \$11 billion and our imports at \$6 billion. That's substantial. It is

greater than the value of all crops grown on our farms (\$10½ billion) and exceeds the value of all shipments of industries such as automobiles (\$9 billion), textiles (\$8 billion) and chemicals (\$8 billion).

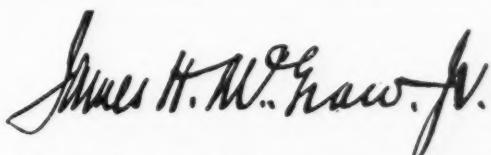
International trade is vital, not to be shrugged off, not to be kicked around as a football of party politics. Republicans and Democrats agree on a non-partisan foreign political policy. They should agree also on a non-partisan foreign economic policy. The foreign relations of the United States, political or economic, can no longer be log-rolled hither and yon.

A general program for international recovery, outlined here, will bring its full quota of aches and pains. But lack of a program will produce economic and political troub-

les on a vast scale; timid retreat will invite economic disaster and war.

By an intelligent, bold and resourceful program, we have a chance to win through to a long peace in the kind of world we want. *Unless America provides the leadership, there can be no such program.* Then Communism merely needs to hang around long enough to pick up the pieces.

Ours is the responsibility and the opportunity.



President McGraw-Hill Publishing Company, Inc.

# Present and Accounted For...



NEWLY ELECTED PRESIDENT of Colorado Contractors Association, Inc., is J. H. MONAGHAN, of J. H. & N. M. Monaghan & Associates, Denver.



SEATTLE CHAPTER of Associated General Contractors has elected JOHN H. SELLEN as president. He heads John H. Sellen Construction Co., Seattle.



REEELECTED PRESIDENT of Associated General Contractors of Illinois is FRED W. SHAPPERT, JR., Shappert Engineering Co., of Belvidere.



HONORARY MEMBERSHIP in American Railway Engineering Association has been awarded to D. J. BRUMLEY, retired chief engineer, Chicago Terminal Improvement, Illinois Central Railroad, Chicago, who entered railroad work in 1895 and retired in 1935 at the age of seventy.



FORMER CONTRACTOR, F. J. C. DRESSER, receives Certificate of Merit for "outstanding fidelity and meritorious conduct" during War from GEN. COURTNEY H. HODGES, commander of First Army. Dresser, one-time associate of Turner Construction Co. and Austin Co., and later conducting his own contracting business in Cleveland, served on Construction Advisory Board. He is now consulting engineer with the Mutual Life Insurance Co. of New York.

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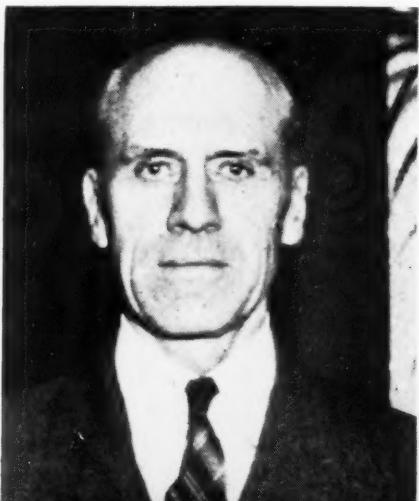
ELECTED PRESIDENT of Association of Highway Officials of North Atlantic States is WALTER B. Mc KENDRICK, JR. (below), assistant chief engineer, Delaware Highway Department.



ELEVATED TO PRESIDENCY of Southeastern Association of State Highway Officials is F. ELGIN BAYLESS (below), chairman of State Road Department of Florida.



NEW PRESIDENT of Mississippi Valley Conference of State Highway Officials is R. C. KEELING (below), Kansas state highway engineer.



# TWO PAGES OF PERSONALITIES



ELECTED PRESIDENT of Alabama Branch of Associated General Contractors is ROBERT W. DETHLEFS, president of Dethlefs & Hannon, general contractors, of Anniston.



ELECTED PRESIDENT of Associated General Contractors of Iowa is T. L. SEARS, owner of Sears Construction Co., of Clear Lake, who has been engaged in road grading and excavation for 25 years. He's also a member of Iowa Sourdoughs of Alaska Highway fame.



HIGHWAY CONTRACTORS' DIVISION of American Road Builders' Association is headed by DONALD O. WHITE, president, American Asphalt Paving Co., Chicago. He is now serving his third term as president of Illinois Road Builders Association.



←  
ELECTION OF EVERETT S. COLDWELL (right) as executive vice-president and DAVID A. UEBELACKER as vice-president and director in general charge of new business activities has been announced by Ford, Bacon & Davis, Inc., engineers, with offices in New York, Philadelphia, Chicago and Los Angeles.



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AT ITS RECENT MEETING, Continental Bridge Co., of Chicago, elected ROY E. SMITH (below) to presidency. Mr. Smith was formerly vice-president in charge of sales for Kelly Steel Works, Inc. He is a member of National Society of Professional Engineers.



NORTHERN CALIFORNIA CHAPTER, Associated General Contractors, has elected GEORGE H. ATKINSON (below) of Guy F. Atkinson Co., San Francisco, as president. He is also newly-elected chairman of the A.G.C. Heavy and Railroad Contractors Division.



NEW PRESIDENT of Southern California Chapter, Associated General Contractors, is M. F. KEMPER (below), head of M. F. Kemper Construction Co., of Los Angeles. His firm developed special pneumatic concrete placing equipment for lining tunnels and is at present concreting several tunnels for Navy's San Diego Aqueduct.





HOME-MADE DISK scarifier, mounted on circle frame of Caterpillar No. 12 grader, loosens shoulder topsoil as first step in widening Tamiami Trail south of Sarasota, Fla. Regular blade on grader later scrapes loosened topsoil off shoulder.

# Special Rigs Simplify Highway Widening



FIVE-DISK SCARIFIER is assembled in sub-frame that bolts to grader circle frame.

## Widening Tamiami Trail

Typical of these operations is a 20-mi. widening project Cobb is working on between Sarasota and Venice on U. S. 41, the Tamiami Trail. An old 18-ft. bituminous macadam road is being widened to 24 ft. by adding a 3-ft. strip on each side. Specifications call for scarifying and removal of topsoil from the shoulders, digging a trench 3 ft. wide and 12 in. deep along each side of the present surfacing, backfilling the trenches with compacted crushed limerock, and paving both old and new sections with a 1½-in. hot mix re-tread.

## Special Disk and Plow

First step in operations is to scarify and remove the grass-matted topsoil from the shoulders. For this purpose T. S. Perry, superintendent on the project for Cobb, built a 5-blade disk scarifier that hangs on the circle frame of a Caterpillar No. 12 motor patrol grader, replacing the conventional moldboard. This rig chops up the grass mat so the topsoil can easily be bladed off the shoulders into the

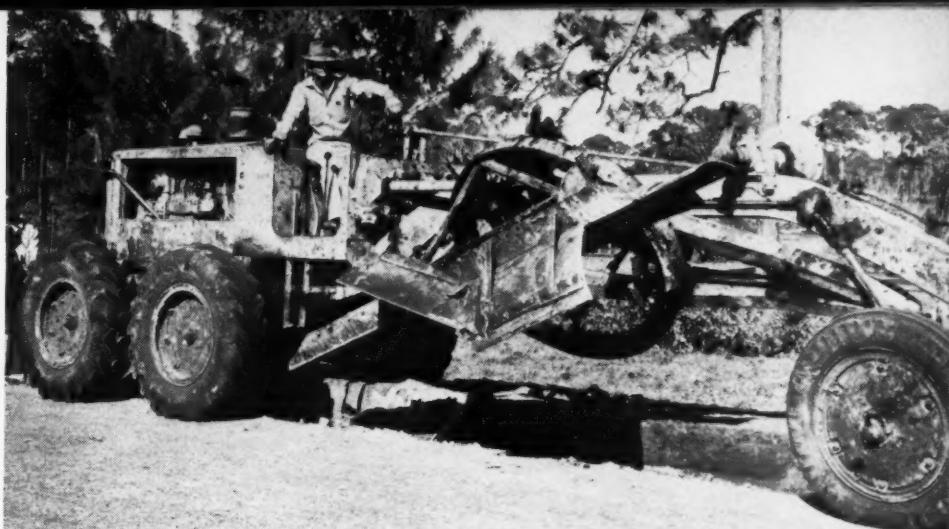


PLOW fastened to grader circle frame excavates trench alongside pavement for replacement with compacted limerock for widening strip base.

ditch with the grader using the regular blade.

Next step is plowing the widening trenches for removal of the sand, muck or unstable clay material in the old shoulders. This is done with another invention of Perry, a blade plow that also hangs from the circle frame of the grader. The plow, as shown in accompanying illustrations, consists of three blades: a guide or wing blade to define the outside limits of the cut, and a plow blade that actually does the excavating, both mounted below a long shallow moldboard that spreads the excavated material on to the shoulder clear of the trench. Plow runs are limited to the amount of trench that can be backfilled and compacted in one day to minimize the danger to traffic of an open trench adjacent to the old pavement.

Backfill for the trenches is crushed limerock shipped by rail from Gainesville to Sarasota, a 220-mi. haul. At Sarasota the material is unloaded directly into 4½-yd. dump trucks by a North-



TRENCH PLOW is lifted for inspection by grader operator A. L. JOHNSON. Plow consists of three-part blade made up of excavating blade and wing fastened below narrow moldboard that scrapes excavated material away from trench.

west crane and clamshell unit. Because the state pays for backfill material by truckload measurement, each loaded truck passes under a strikeoff timber carried on two poles. Here excess material is scraped off the load, or a few shovelfuls of rock are added by

hand, if necessary, to exactly fill the truck bodies.

Backfill material is placed in the trench by a new design spreader made by All Purpose Spreader Co., Elyria, Ohio. Cobb has the first of this type equipped with a belt conveyor that replaces a screw

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CLOSE-UP VIEW of plow lined up for excavating but lifted clear of ground for inspection. Plow cuts trench 3 ft. wide and 12 in. deep alongside old pavement.

HERE IS TRENCH left by one pass of the plow. Shoulder here is in soft sand, but elsewhere in firm material trench sides stand up until backfilled.



CRUSHED LIMEROCK (below) for backfilling widening strips is hauled from railroad cars to job in dump trucks that must be flush loaded, as payment is based on truckloads. Excess material is scraped off or extra material is added if necessary at this checking station.





**BACKFILL** of crushed limerock is placed in trench by All Purpose spreader designed for this type of work. Trucks back up to spreader and dump into hopper as spreader pushes truck ahead under its own power.



**LIMEROCK** is transferred from spreader hopper to trench by belt conveyor. Adjustable screed on carriage riding in trench regulates depth of backfill.

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FRONT-END VIEW of spreader (below) waiting for another truck load of limerock. Trench is filled with two passes of spreader. Here top layer is being placed.



FINAL STEP in preparing base for widening strips is compaction of backfill (below) by one rear wheel of 3-wheel roller. Roller also compacts half-filled trench after first pass of spreader.

conveyor on former models. Loaded trucks back up to the spreader, and as the body is raised to dump the load into the spreader hopper, the machine moves forward under its own power, pushing the truck. Material is carried from hopper to trench by the belt conveyor, leading off at an angle to an adjustable spreader hopper carried by a rubber-tired trailer in the trench. Truck and spreader machine both stay on the pavement.

#### Compaction by 3-Wheel Roller

The first pass of the spreader fills the trench slightly more than half full. A trip by a 3-wheel roller, one rear wheel riding in the trench, compacts the lower layer of backfill. A second pass of the spreader and another rolling completes the backfilling operations. Final rolling leaves the backfill flush with existing pavement, and as the limerock packs tightly under a smooth surface, there is no danger to traffic that might run off the pavement. When the entire stretch has been widened, the 1½-in. retread topping will be placed over the entire width of road, old and new.

Traffic is flagged single lane around the spreader, and is stopped entirely while trucks turn around on the pavement.

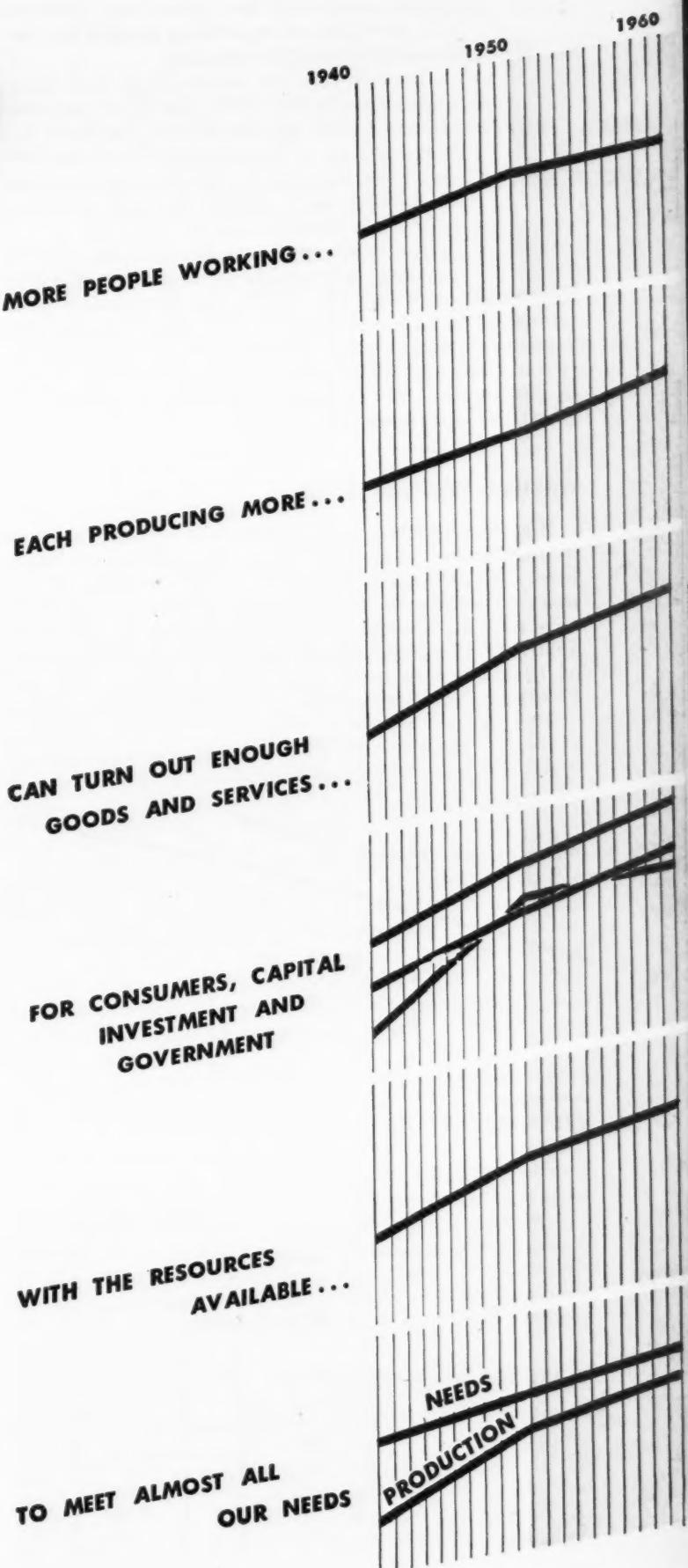
H. D. Bondy is project engineer for the state highway department. T. S. Perry is superintendent and Geo. McLain is general foreman for the contractor.



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# 1950-1960

The Twentieth Century Fund, a privately-endowed research foundation, has just completed a monumental 875-page work called "America's Needs and Resources." In it is presented a detailed preview of what economic life in the U. S. A. during the 1950-60 decade will be like if we succeed in maintaining high-level employment. From the findings of the Twentieth Century Fund survey, the McGraw-Hill Department of Economics has prepared this synopsis, which highlights points of interest to readers of this magazine.



## POPULATION

A nation's wealth depends more than anything else on the size and vigor of its population. Much of the increase in U. S. production during the past hundred years is a result of a rapid growth in population. This growth supplied manpower for farms and factories and provided an expanding market for consumer goods and services.

Growth was the outstanding fact about population before 1930. The birth rate was almost double the death rate and there was a heavy flow of immigrants. Between 1900 and 1930, the population increase averaged 15 million each decade. Immigration contributed a third of the increase.

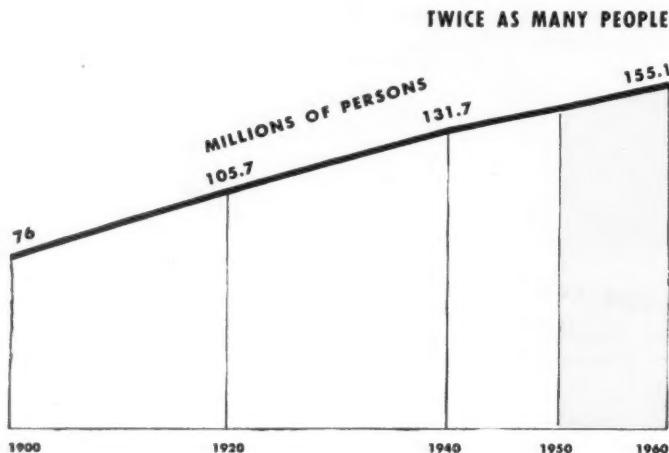
But this trend was checked by the depression 30's which stemmed the flood of immigrants and cut the birth rate by forcing postponement of many marriages. As a result, fewer than 9 million persons were added to the population between 1930 and 1940. This was an important factor in prolonging the depression because it slowed the growth of consumer markets.

### MORE PEOPLE

### WORKING ...

### WARTIME MARRIAGE BOOM

War and postwar conditions have brought a boom in marriages. They have exceeded normal by more than 1,500,000 since 1940. There will be more newly-married couples in 1950 than ever before and the birth rate may be roughly 10% higher than in the early 1930's. So the 20th Century Fund looks for an increase of 12 million in total population between 1940 and 1950 and a further increase of 10 million in the 1950's.



This will mean a faster-growing market for homes, autos, food, clothing, and other consumer items than we had in the 1930's. It will mean crowded schools and more people seeking jobs.

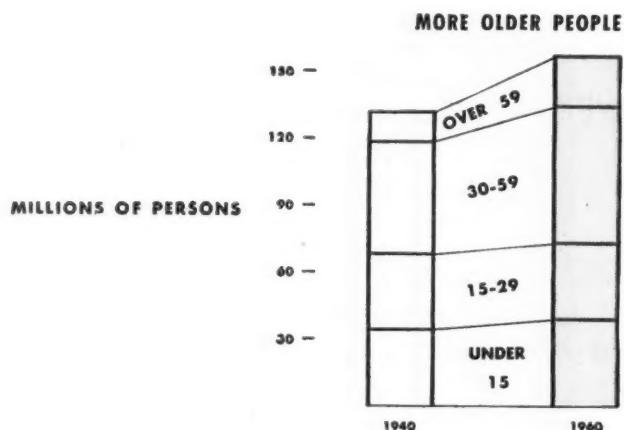
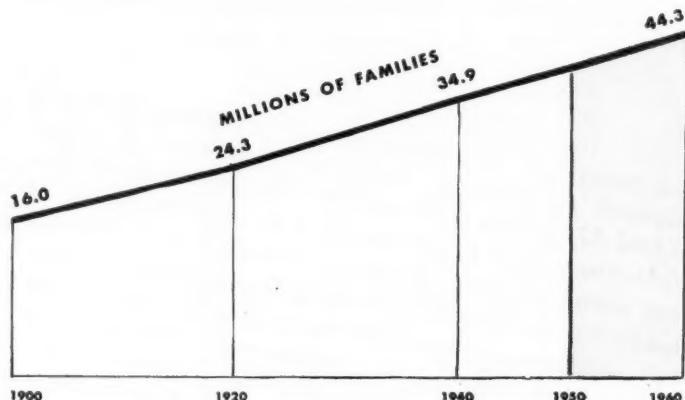
There are four major population trends which will affect markets in the 1950's:

1. The number of families will continue to increase more rapidly than the number of people as families grow smaller. This is significant because the market for housing, appliances, and many other things depends more on the number of families than on the number of people.

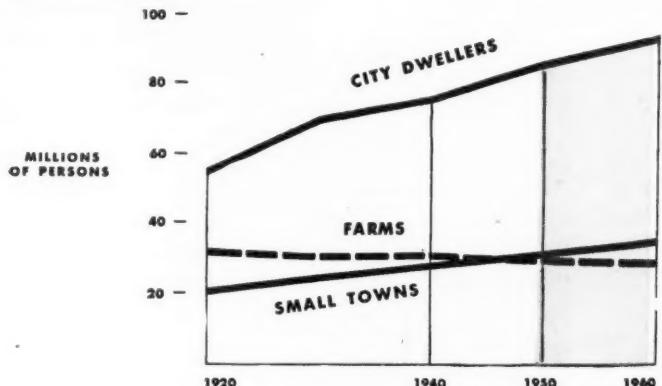
2. Our population will be getting older. But it will not be getting less productive because the proportion of the population between the ages of 20 and 60 will be higher than in past decades. Still, the most striking increase will take place in the number of people over 60—from 14 million in 1940 to more than 20 million in 1960. This will bring greater demand for medical services and social security. An important cause of this trend is our success in controlling communicable disease. The following table shows how the death rate from selected causes has changed since 1900.

	Death Rate Per 100,000 Persons	
	1942	1900
Diseases of heart	295	137
Cancer and other malignant tumors	122	64
Influenza	56	202
Tuberculosis	43	194
Diarrhea and enteritis	9	143
Whooping cough	2	12
Diphtheria	1	40
Measles	1	13
Typhoid and paratyphoid fever	0.5	31
Scarlet fever	0.3	10
Other	505.2	873
	1035.0	1719

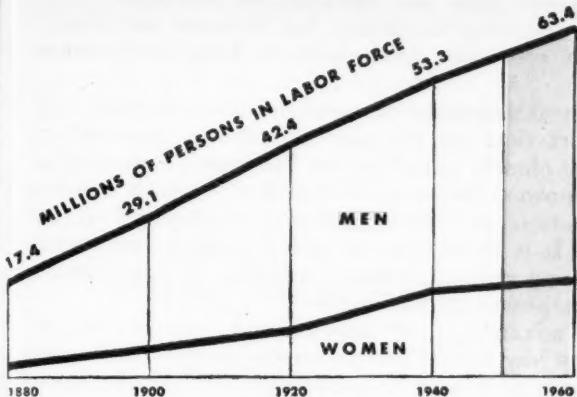
### BUT THREE TIMES AS MANY FAMILIES



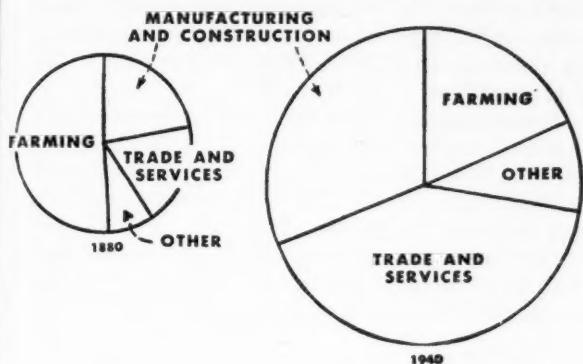
### MORE CITY DWELLERS



## MORE AND MORE WOMEN ARE SEEKING JOBS



## FARMING IS GIVING WAY TO OTHER OCCUPATIONS



3. The population will continue to become more urbanized. Small and medium-sized cities will grow faster than the largest cities. The general westward migration which was accelerated by the war will continue.

4. Our people will keep on getting more homogeneous. There has been almost no immigration since 1929, so the number of immigrants who have been in the country for less than 20 years will make up less than one percent of the population in 1950 as against 10% in 1930.

An even more important factor in making the population all of a kind has been the growth of universal education. The proportion of children 14-17 years old attending high school doubled between 1920 and 1936. The rise of the radio, movies, and national magazines has also levelled us out. These developments not only raise the general educational level of the nation but also tend to standardize the public's tastes and attitudes.

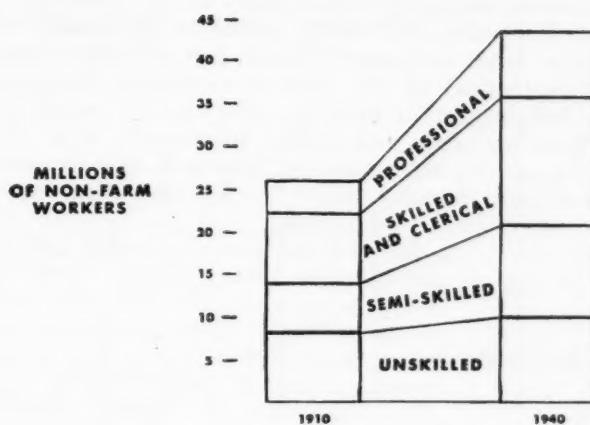
## Labor Force

The volume of goods and services produced by 145 million persons in 1950 and 155 million in 1960 will depend on what share of the population is in the labor market and the amount of work those employed actually do. The proportion of the population in the labor force has shown little change in the past few decades. So the 20th Century Fund assumes that the relationship between labor force and population will be about the same in 1950 and 1960 as it was just before the war. On this basis 60 million people will be in the labor market in 1950 and 63.4 million ten years later.

As you can see from the charts, however, there will be several important changes in the composition of the labor force. More women will be working. In 1870 only one out of every eight worked. By 1940 the pro-

## ANATOMY OF THE LABOR FORCE

### THE LABOR FORCE IS GROWING MORE SKILLED



portion had grown to one out of four, and evidently will go on rising.

However, the increase in the number of women working will just about be offset by earlier retirements and longer schooling. This explains why there is little change in the ratio of labor force to population.

## UNEMPLOYMENT

The effectiveness of the labor force depends not only on its size but on how fully it is employed. We have never had full employment in the sense that everyone able and willing to work had a job at the same time. Even in good years unemployment has seldom averaged less than 5% of the working force because workers are always moving from job to job. And in 1932, nearly one-fourth of all workers were unable to find jobs.

For this reason, the 20th Century Fund assumes that, even with good business in the 1950s, unemployment will average 5% of the labor force. This works out to 3 million unemployed in 1950.

In addition, the Fund expects the long down-trend in average weekly hours to continue. A century ago, workers put in a 12 hour day for 6 days a week. By 1940 the average work-week had declined to 44 hours in non-agricultural jobs and 52 hours in agriculture. If this trend continues, the average in non-farm jobs will be down to 38 hours a week in 1960, and farmers will work 48 hours.

Adding all this up, and allowing for vacations, absenteeism, and sickness, the 20th Century Fund estimates that the U. S. will put in 121 billion man-hours of work in 1950 and 118 billion in 1960. This compares with 105 billion in 1940 and with 154 billion at the peak of the war effort. The quantity of goods and services that can be turned out with this amount of labor effort will depend on average output per man-hour, or productivity.

## PRODUCTIVITY

The key to our future economic welfare is productivity. It is the five-fold increase in output per man-hour that has made it possible for us to work shorter hours and still enjoy a rising standard of living. This increase in productivity has been accomplished not by working harder but by constantly inventing better machinery to supplement human energy with mechanical power.

Of course, in any specific factory at any given time, productivity depends largely on the willingness and ability of labor and management. But over the years, the actual effort of the individual worker becomes much less important than the effort of the machine. The most energetic and skilled blacksmith of a century ago could not remotely approach the productivity of today's semi-skilled worker operating automatic power-driven equipment.

In 1860, the average worker turned out 33¢ (in 1944 dollars) worth of goods in an hour. By 1940, this had grown to \$1.22. This sensational increase in productivity was due to the increased use of power-driven machines. In 1860, the average worker had the help of only half a horsepower of animal or mineral energy. In 1940, he had the use of 2.7 horsepower. To put it another way, if there

had been no increase in the use of mechanical power since 1850, it would have taken 290 million workers to turn out the amount of goods and services actually produced at the peak of the war effort by only 63 million workers.

## DO MACHINES KILL JOBS

Past history also shows that we need not fear the long run effects of the introduction of labor-saving machines. On the contrary, the only way we can improve the material welfare of everyone is to continue and even step up the rate at which we save labor by using machines.

Some people, it is true, are thrown out of work and a few of them may not be able to find other jobs easily. But mechanization more than compensates for "technological unemployment" by making it possible to produce more and better things for everyone—things that themselves create jobs. Development of the railroads and the automobile, for example, put a lot of canal boat and livery stable operators out of business. But it cut the cost of transportation and created many times more jobs than it eliminated.

The 20th Century Fund also points out that the most important reason that the technological revolution developed luxuriantly in the U. S. between 1850 and 1940 was that competitive enterprise provided a generally favorable climate. It is true that natural resources were plentiful and that the population was growing rapidly both in numbers and in skill. But what we had to a unique degree here was an atmosphere which favored risk-taking, fostered the vast capital investment necessary to harness and apply mechanical energy, and provided the incentives necessary to put capital and inventiveness to work.

No other economy has equalled ours in the ability to produce more and more with continually diminishing human effort. The test it now faces is whether it can eliminate the ups and downs in production and employment that have gone along with it. But an abundance of evidence indicates that we ran into

## EACH PRODUCING MORE ...

trouble after 1929 not because we developed too many labor-saving machines but because we didn't adjust our economic mechanism to keep the process going.

The key importance of mechanization is indicated by the fact that the increase in national production since 1860 closely parallels the increase in use of mechanical power. Between 1860 and 1940, both volume of production and use of energy multiplied about 11 times. It is clear that, in order to keep our standard of living rising, we must continue to apply more and more power to production.

Chief advantage of mechanical energy is, of course, its low cost. Electric energy is now delivered for as little as a cent a horsepower, while the same amount of human energy costs \$10.

And there are other important advantages. Mechanical energy can be delivered in greater concentrations than any other form. It is also more convenient, compact, mobile, and controllable. Consolidated Edison in New York delivers enough electricity in a day to do the work of 3 million draft horses.

These advantages are now so universally accepted that it's hard to realize how recently we left the horse and buggy era. At the turn of the century, animals and men provided more than half the energy used in production and transportation. It wasn't until World War I that trucks replaced horses in local hauling and tractors began to invade the farms. Here is how the use of mechanical energy has grown since 1850:

	Total Energy Output (Billions of Horsepower- Hours)	Percent Supplied by:		
		Mechanical Energy	Humans	Animals
1850	17.6	6	15	79
1860	25.2	7	14	79
1870	27.8	12	15	73
1880	39.9	17	14	69
1890	61.1	28	12	60
1900	82.9	38	10	52
1910	131.4	57	8	35
1920	197.4	73	6	21
1930	238.3	84	5	11
1940	289.4	90	4	6
1950	410.4	94	3	3
1960	489.8	96	2	2

## PRODUCTIVITY IN THE FUTURE

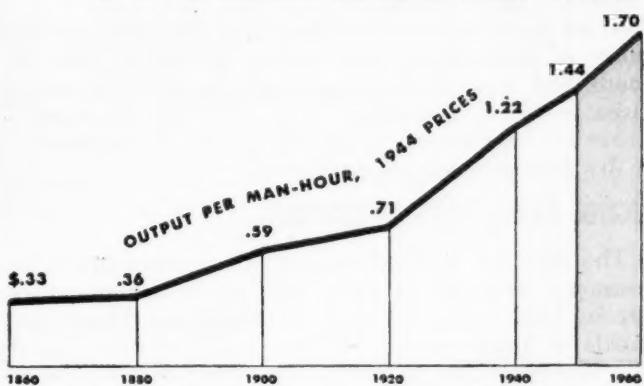
Any attempt to predict future developments in productivity is complicated by the fact that the changes do not occur at an even rate. Between 1850 and 1940 the average increase in output per man-hour was 18% per decade. But the changes varied all the way from 3% between 1870 and 1880 to 42% for the decade ending in 1940. There is, therefore, no simple way to extend past trends to obtain a fool-proof figure for productivity at a future date.

For purposes of this study, however, the 20th Century Fund assumes that the average rate of increase since 1850 may be projected to estimate output per man-hour in 1950 and 1960. Thus, output per man-hour works out to \$1.44 in 1950 and \$1.70 in 1960 as against \$1.22 in 1940 (all in 1944 dollars).

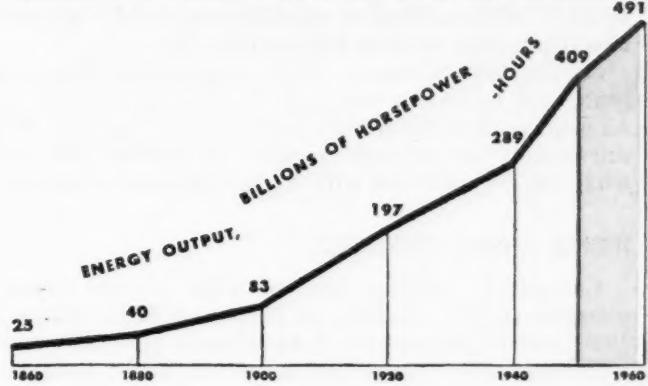
As the Fund points out, this is a critical assumption, and it is further complicated by the fact that there is a wider possibility of error in this estimate than in most of the others in the study. If, for example, it is assumed that productivity will increase at the pace set from 1920 to 1940 which averaged 36% per decade, then 1960 production would be about double the 1940 level instead of only 157% of it, as the 20th Century Fund estimates.

## A CENTURY OF ECONOMIC PROGRESS 1860-1960

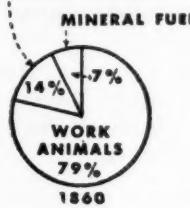
OUTPUT PER MAN-HOUR SHOULD BE 5 TIMES AS GREAT



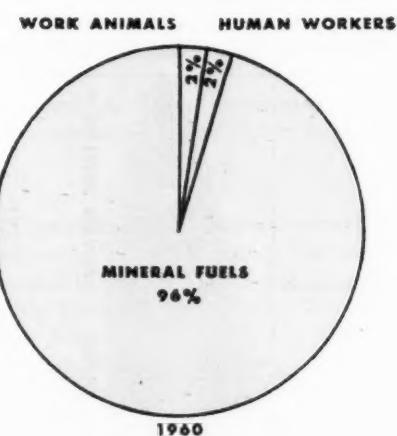
BECAUSE OF A STEADY GROWTH OF POWER AND MACHINES



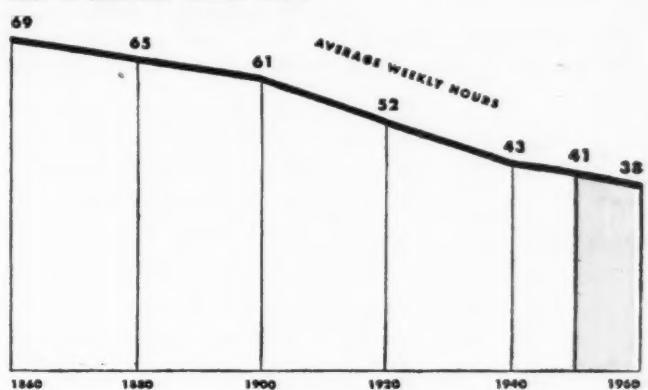
HUMAN WORKERS



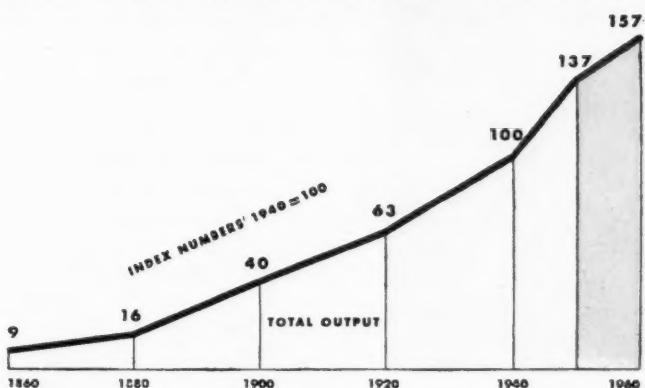
SO WITH LESS EFFORT



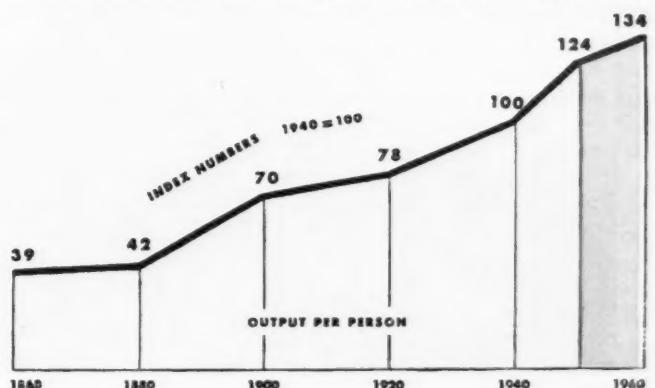
AND A SHORTER WORK WEEK



6 TIMES AS MANY WORKERS CAN PRODUCE 17 TIMES AS MUCH



AND PROVIDE 3½ TIMES AS MUCH OUTPUT FOR EACH PERSON



## TOTAL NATIONAL OUTPUT

The potential volume of goods and services in 1950 and 1960 can be determined by simple arithmetic, using the assumptions outlined on the preceding pages. Of an estimated population of 145 million in 1950, about 60 million persons will be in the labor market and 57 million of them will have jobs if we succeed in keeping business activity at a high level.

This many people would work 121 billion man-hours. With output per man-hour estimated at \$1.44 (in 1944 dollars) the total value of goods and services produced, or the gross national product, would come to \$177 billion. Similar calculations yield a gross national product of \$202 billion for 1960.

As the 20th Century Fund emphasizes, these estimates are neither a forecast of actual production nor an appraisal of maximum potential production. They are merely an attempt to show in dollars and cents what can be achieved with high-level employment.

## HIGHER LIVING STANDARDS

Compared with any prewar year, a gross national product of \$177 billion in 1950 and \$202 billion in 1960 would represent a handsome gain. It would make possible a substantial rise in living standards.

In 1950 we would produce a fifth more than in 1941.

However, the volume of goods and services turned out in 1950 would be only slightly higher than present production. This is because the number of persons at work today is 2 million above the estimated normal for 1950, and average weekly hours are higher than they will be then. Almost a

CAN TURN OUT  
ENOUGH GOODS  
AND SERVICES . . .

the estimated normal for 1950, and average weekly hours are higher than they will be then. Almost a

million and a half of the emergency workers drawn into the labor force during the war are still at work and unemployment is lower than the figure assumed for 1950.

The estimates of 1950 and 1960 gross national product, as well as the figures for past years used in the chart, are expressed in 1944 prices. This is not a prediction that the price level will settle down to the 1944 level which would involve a drop of 18% in the cost of living and 26% in wholesale prices. It is merely a device to eliminate price fluctuations so that the figures will show only the actual changes in the physical volume of production.

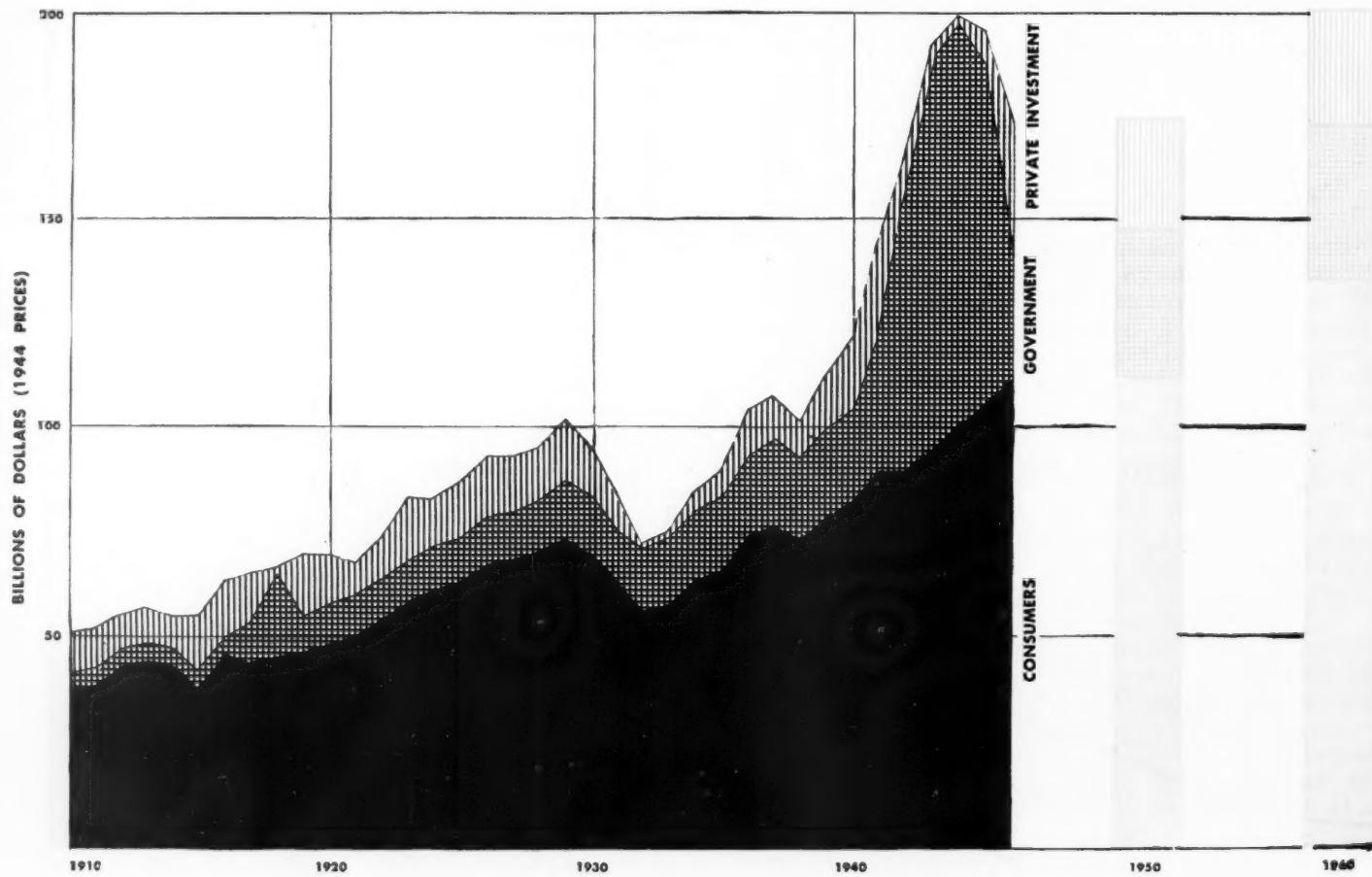
Gross national product measures the total market value of everything the nation produces. All the goods and services produced are absorbed in one of three ways: by consumer expenditures; by expenditures for investment in capital goods or inventories; or by government expenditures.

## HIGHER TAXES, LESS INVESTMENT

The division of total output among consumers, investment, and government will be somewhat different in 1950 and 1960 than in the past. About two-thirds of total output will go into consumer goods and services. This is about the same as the proportion in prewar years.

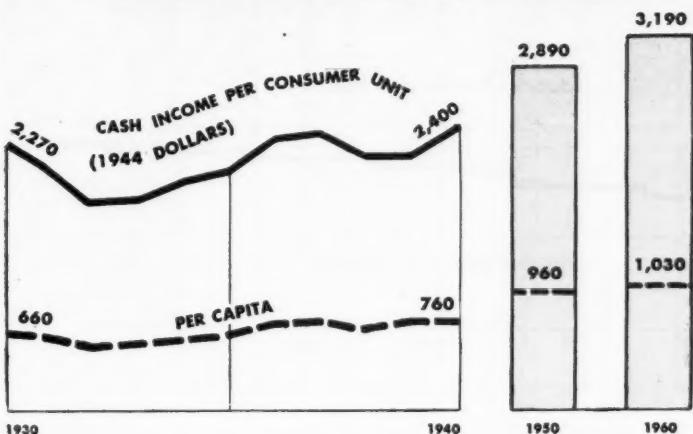
Government's share will continue to grow, however. It rose from 11% of total output in 1929 to 17% in 1940. At the peak of the war effort, half of all production went to Uncle Sam. Government expenditures have dropped to less than half the war peak and they will continue to decline slowly. But government's share will still run to around 20% in the 1950's. On the other hand, the ratio of investment to total output shows a slight long term decline.

HOW TOTAL OUTPUT IS DISTRIBUTED

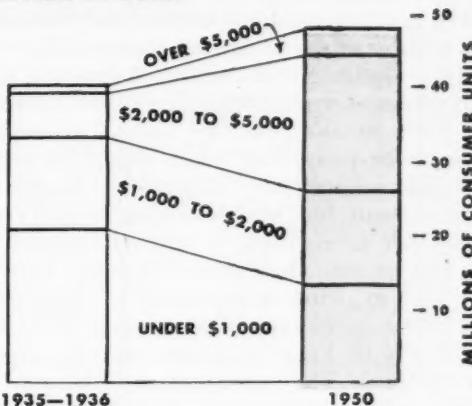


## MORE CONSUMER PURCHASING POWER

CONSUMERS WILL BE ABLE TO BUY 50% MORE THAN IN 1930'S



EVERY OTHER FAMILY...INSTEAD OF EVERY SIXTH FAMILY...  
WILL HAVE \$2,000 OR MORE TO SPEND.



### CONSUMER INCOME

U. S. business can look forward to a 1950 consumer market twice as large as in the worst year of the depression, half again as large as in 1929, and one-fifth larger than in 1941. That is the major conclusion of the 20th Century Fund's analysis of consumer purchasing power. Here are the steps by which it arrives at that conclusion:

- With gross national product at \$177 billion in 1950, past experience indicates that income payments to individuals would run to \$138 billion.
- Income tax rates are assumed to equal the 1942 schedules, so individuals would pay \$11 billion in taxes (as against \$19 billion in 1946).
- Savings are estimated at \$12 billion, or about 9% of income after taxes.
- Subtracting taxes and savings, consumer purchases of goods and services would total \$116 billion.

### LOWER SAVINGS

Many experts would criticize the assumption that savings will amount to only 9% of income. Some of them look for a ratio as high as 20% in prosperous postwar years. The 20th Century Fund justifies the use of a low figure on three grounds: (1) people built up reserve of savings during the war; (2) expanding social security will reduce the need to save for old age; and (3) taxes will cut into savings. The Fund's estimate of savings plus taxes in 1950 adds up to a higher percentage of income than in prosperous prewar years.

The standard of living won't rise as rapidly as the total income going to consumers, because the increased income will be split up among more family units. But the average consumer unit (a family or a single person living alone) will be a third better off in 1960 than in the 1930's.

Shifts in the distribution of income will be even more important, from a marketing standpoint, than the general increase in over-all consumer income. More consumer units will be in the over-\$2000 brackets than ever before and this group will be receiving a much larger share of total consumer income.

Part of the apparent increase in income is cancelled out by higher prices. To show the actual increase in purchasing power, the figures should be

adjusted for an estimated one-third increase in the 1950 price level over that of the mid-1930's. This would mean that a \$2,650 income in 1950 would buy no more than a \$2,000 income in 1935-36. Even if this adjustment is made, the resulting figures still show a striking upward shift.

Income Class	Consumer Units		Cash Income	
	in Millions		in Billions	
	1935-36	1950	1935-36	1950
Total	39.2	47.9	\$85.0	\$135.0
Under \$1000	20.8	13.0	17.0	7.7
\$1000-2000	12.2	12.9	28.1	21.5
\$2000-5000	5.5	18.2	23.8	62.1
Over \$5000	0.7	3.8	16.1	43.7

In addition to dollar income, shown in the above table, consumers also receive "income in kind"—food and fuel produced by farmers for their own use, board and lodging received by domestic servants. Such income will have a value estimated at \$3.3 billion in 1950, most of which will supplement the \$7.7 billion received by those in the "under \$1000" bracket.

The urban market will continue to be far more important than the rural market. Consumer units in cities will receive cash incomes of \$3,445 on the average in 1950, more than twice the farm average of \$1,635 and almost twice the small town average of \$1,880.

### THE FARM MARKET

These figures don't provide an accurate measure of the relative importance of the rural and urban markets because rural consumers pay a lot less for food, fuel, shelter and so have more to spend for other things. If there were any way to adjust for these things, the figures would show a smaller spread between the two markets, but the urban market will still be dominant.

All these figures underline a general upgrading in consumer demands which would accompany high-level production and employment. It will have a profound effect on marketing practices. The average person will eat better, dress better, and live in a better house with better equipment. And he will have more money to spend for travel, recreation, and luxuries.

### FOR CONSUMERS ..

## CONSUMER MARKETS

The improvement in living standards during the 1950 decade will lead to important changes in the way consumers spend their dollars. Even though they will eat better, dress better, and live in better houses, a smaller share of the consumer dollar will be spent on food, clothing and shelter. A growing share will go for appliances, furniture, travel, and recreation.

This means that the fastest growing markets will be those providing what might be called "optional" goods and services — things which add to comfort and enjoyment but which are not strictly necessary. Markets for necessities, on the other hand, will expand at a slower rate than total consumer expenditures.

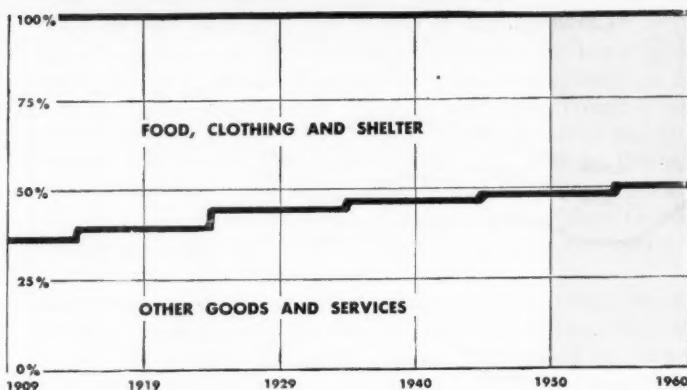
The growing importance of "optional" goods and services is one of the reasons why it's increasingly difficult to keep our economic machine going on an even keel. The purchase of "optional" goods can be postponed with little hardship. So anything that causes people to put off buying a new car, a new house, or a new radio has a far greater effect on production and employment now than it did when the major share of the consumer dollar went for necessities.

Some of the trends in major markets are summarized in the following sections.

### FOOD

Although food is by far the largest item in the consumer budget, its relative importance is declining slowly as living standards rise. People eat the same number of pounds of food they ate in 1909 but the food is better from a nutritional standpoint and easier

### STANDARD OF LIVING YARDSTICK: MORE OF THE CONSUMER DOLLAR GOES FOR THE COMFORTS OF MODERN LIFE



to prepare. Thus, the trend favors fruits, vegetables, and dairy products as against meat, potatoes, and bread.

More and more food is being processed in factories rather than in consumer kitchens. Improved methods of manufacture and distribution have transformed the luxury foods of yesterday into the standard foods of today. New kinds of processed foods — canned, frozen, and dehydrated — are appearing constantly.

### CLOTHING

Three long term trends will shape the clothing market in the future: (1) the shift from home and custom to factory fabrication is almost complete;

### WHERE CONSUMER DOLLARS GO

(Figures in Billions of Dollars)

	1909	1919	1929	1940	1941	(1944 Prices) 1950	1960
Total Consumer Expenditures .....	28.8	60.8	80.3	70.6	80.4	116.2	134.2
Food, Liquor, and Tobacco .....	9.9	22.3	23.7	21.9	25.3	36.2	41.1
Food .....	7.4	18.8	19.9	16.4	19.0	27.2	30.8
Liquor and Tobacco .....	2.5	3.5	3.7	5.5	6.3	9.0	10.3
Clothing and Personal Care .....	4.4	9.8	12.1	9.8	11.5	16.2	18.7
Housing .....	6.8	10.1	14.4	12.6	13.3	19.3	21.4
Rent a. .....	5.5	7.9	11.3	9.1	9.7	14.0	15.4
Fuel .....	1.0	1.5	1.7	1.7	1.8	2.5	2.8
Electricity .....	0.1	0.3	0.6	0.9	1.0	1.6	1.8
Household Equipment and Operation .....	2.8	6.2	10.6	8.7	10.3	15.0	17.4
Appliances .....	0.2	0.4	0.8	1.0	1.3	1.8	2.4
Consumer Transportation .....	1.6	5.2	8.6	7.3	8.6	12.7	16.4
Autos and Private Planes b. ....	0.6	3.5	6.0	5.7	6.8	9.6	12.7
Local Bus and Street Car .....	—	—	0.8	0.7	0.8	1.5	1.5
Intercity Bus .....	—	—	0.1	0.1	0.2	0.2	0.2
Airlines .....	—	—	c.	c.	c.	0.1	0.5
Railroads .....	0.4	0.8	0.6	0.3	0.3	0.4	0.3
Medical Care, Insurance, and Death Expenses ...	1.1	2.8	4.5	4.7	5.2	7.7	8.7
Recreation .....	0.9	2.1	3.8	3.3	3.7	5.7	6.9
Radio and Television Sets .....	0.2	0.7	1.0	0.6	0.8	1.1	1.3
Private Education, Religion, and Welfare .....	1.2	2.2	2.7	2.3	2.4	3.4	3.7

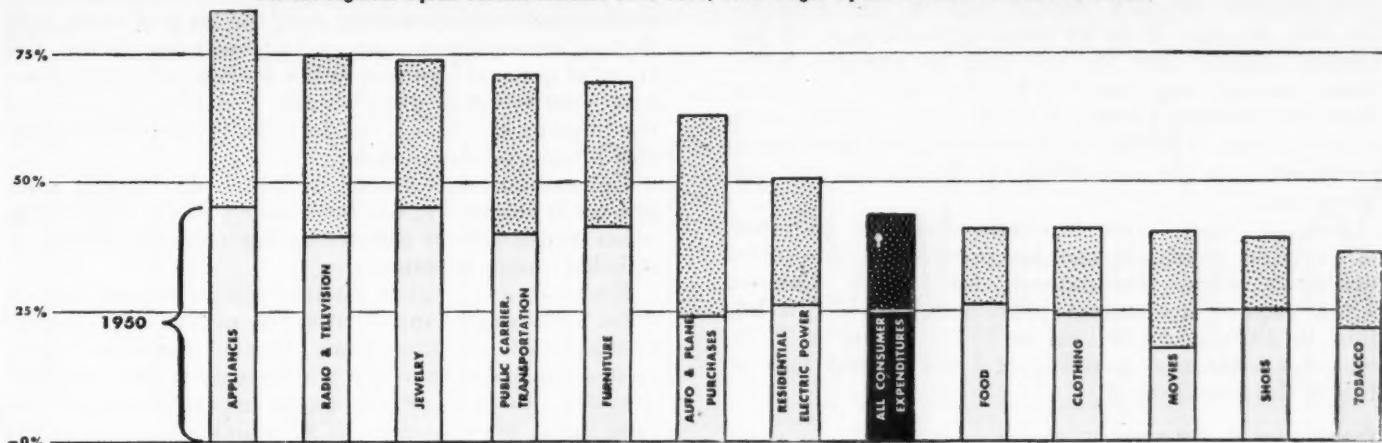
a. Includes Estimated Rent for Owner-Occupied Homes.

b. Includes Original Cost and Operating Expenses.

c. Less than \$50 Million.

## CONSUMER MARKETS IN 1950 AND 1960: Percent Increase in Sales Over 1940

Bottom Segment Equals Percent Increase 1940-1950; Total Height Equals Percent Increase 1940-1960.



(2) synthetics, chiefly rayon and nylon so far, are replacing cotton, wool, and silk at an accelerating pace; (3) there's greater standardization of styles and a trend to lighter and simpler clothing.

In 1909 consumers spent 14% of their income for clothing but by 1940 the ratio had declined to 12%. However, this long run decline may be halted or reversed. The migration from farms to cities, the upgrading of incomes, and the growing demand for sports clothing will increase clothing expenditures.

## HOUSING

The decline in the relative importance of housing expenditures — from 24% of consumer dollars in 1909 to less than 18% in 1940 — is expected to continue. The reason is that people feel they get more value

for their dollars in other things than housing. Nevertheless, the housing market should be much larger in the 1950's than in the 1930's because much of our housing needs to be repaired or replaced.

A Census survey in 1940 showed that 16 million of the nation's 37 million dwelling units needed to be replaced or needed major repairs. The 20th Century Fund estimates that the provision of adequate housing for everyone by 1960 would involve building 20 million new units and rehabilitating 5.4 million at a total cost of \$115 billion (1944 prices). The Fund also estimates that we will fall 15% short of this goal even with continued high-level employment.

## HOUSEHOLD EQUIPMENT

More and more of the consumer dollar has gone for household equipment in the past four decades, largely because of the development of labor-saving appliances. The outlook is for a continuation of this trend. New appliances are being developed; and the large number of new houses slated to be built in the next few years, the wartime and postwar boom in the number of families, and the migration to the cities should add to appliance demand. The same factors should brighten the outlook for furniture, rugs, and other household items.

Some appliance markets may be saturated by the 1950's, however. A few years of high production would fill our homes with refrigerators, for example. However, replacement demand would run to 2.7 million units in 1960 and there would be a demand for 1.3 million refrigerators to equip new houses, so the market would still be bigger than in 1941 when 3.6 million were sold. However, new products must be developed if the industry is to keep up the pace it has set in the past.

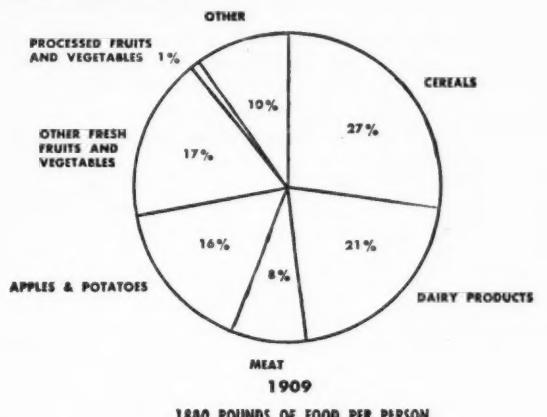
## TRAVEL

In 1916 the average person traveled 400 miles. By 1940 the average had grown to 2,400 miles, chiefly because of the rise of the automobile. The 20th Century Fund expects this growth to continue because as their incomes rise people spend more money traveling.

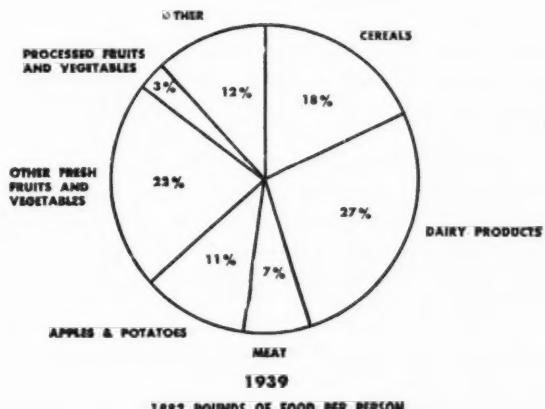
A good share of the increased spending will go to purchases of cars and planes. The Fund estimates that there will be 36 million cars on the road and 100,000 private planes in the air in 1950. The auto industry would be able to sell 5 million new cars a year after 1950 — 4 million for replacement and a million for population growth.

## OUR CHANGING DIET: MORE MILK, FRUITS AND VEGETABLES

### LESS MEAT, POTATOES AND BREAD



1880 POUNDS OF FOOD PER PERSON



1882 POUNDS OF FOOD PER PERSON

## CAPITAL INVESTMENT

Investment plays a crucial role in our economy for two reasons. It is by plowing back part of our annual output that we are able to provide better machines and equipment to keep productivity rising. But the amount ploughed back varies widely from year to year. This unevenness of capital investment contributes to the instability of production and employment.

Because capital investment involves the purchase of durable goods, it can be postponed almost indefinitely when the outlook for profits darkens. Thus, capital investment plummeted from \$18 billion in 1929 to \$5 billion in 1933, a drop of 72%, whereas consumer spending fell only about half as fast in the same period.

## MORE FOR EQUIPMENT

There has been an important shift in the relationship between construction and equipment, the two major types of investment. Before World War I, construction made up around three-fourths of total investment but the ratio declined to less than half in 1935-39. Part of the decline is, of course, explained by the fact that the depression left us with ample plant capacity but provided an incentive to buy more efficient machines to cut costs. Nevertheless, there is a well-defined trend towards allocating an increasing proportion of investment to equipment rather than to plant construction.

A little less than two-thirds of total investment goes into industrial plants and equipment. Housing and other consumer construction (hospitals, schools, churches) averaged 27% of total investment during the interwar period. Housing fell from a peak of \$6 billion in 1926 to \$4.7 billion in 1929 and \$600 million in 1933; and it had recovered only half the 1926 volume by 1940.

While other types of investment follow the ups and downs in general busi-

ness, investment in housing construction follows a cycle of its own. This housing cycle is determined by factors such as the vacancy rate, the level of rents, and that of construction costs, which may not follow the trend of general business. When a drop in general business activity takes place during a declining phase of the housing cycle, as it did in 1929, the result is a deep and prolonged depression.

Government investment, of which the largest component is highways, has been much more stable than other types but it doesn't swing enough weight to stabilize total investment.

Because of the wide fluctuations in capital investment, it's much more difficult to estimate future capital expenditures than future consumer purchases. In order to make a relatively stable forecast, the 20th Century Fund bases its estimates on the long term trend since 1879, which shows a slight decline in the share of total output going to capital investment. Thus, investment under conditions of stable prosperity in the 1950 decade is estimated at 16% of total output as compared with a ratio of more than 18% in the late 1920's. On this basis, estimated capital expenditures work out to \$28 billion for 1950 and \$33 billion in 1960. Our ability to maintain high employment and rising living standards will depend in large measure on our ability to invest that much profitably in new machinery and buildings.

## CAPITAL NEEDS

Analysis of our capital needs lends little support to the idea prevalent during the 1930's that we had reached economic maturity so that there was no way to invest as much as we had in earlier decades. No one has ever made an estimate of how much it would cost to modernize our industrial plant, which is valued at around \$200 billion at prewar prices. If as much as a third of it needs to be replaced or rehabilitated, around \$100 billion (current prices) of additional investment will be required.

In addition, huge amounts of money need to be invested in housing and public works to raise the serv-

## CAPITAL INVESTMENT...

### WHERE INVESTMENT DOLLARS GO

(Figures in Billions of Dollars)

	(Annual Averages)						
	1920- 1924	1925- 1929	1930- 1934	1935- 1939	1940- 1944	(1944 Prices) 1950 1960	
Total Capital Investment .....	\$12,428	\$17,186	\$8,215	\$10,445	\$12,340	\$27,700	\$33,000
All Industries .....	7,570	10,112	5,272	6,889	8,089	17,800	21,125
Manufacturing .....	1,996	2,362	1,074	1,610	3,731	4,200	5,025
Food .....	261	357	194	244		228	273
Textiles .....	227	212	92	117		175	210
Steel .....	138	188	110	192		853	1,021
Autos .....	105	150	78	146		369	441
Chemicals & Petroleum .....	70	95	68	142		928	1,111
Machinery .....	—	—	—	28		180	216
Other .....	510	625	213	409		1,462	1,750
Transportation .....	1,797	2,303	1,277	1,822	805	4,300	5,100
Commercial .....	1,196	1,940	777	719	833	1,950	2,300
Utility .....	693	999	483	422	780	1,500	1,625
Other .....	1,888	2,508	1,661	2,316	1,940	3,950	4,700
Consumer Construction .....	3,806	5,557	1,547	2,256	2,912	7,200	8,255
Government Construction .....	1,052	1,517	1,396	1,299	1,338	2,700	3,620

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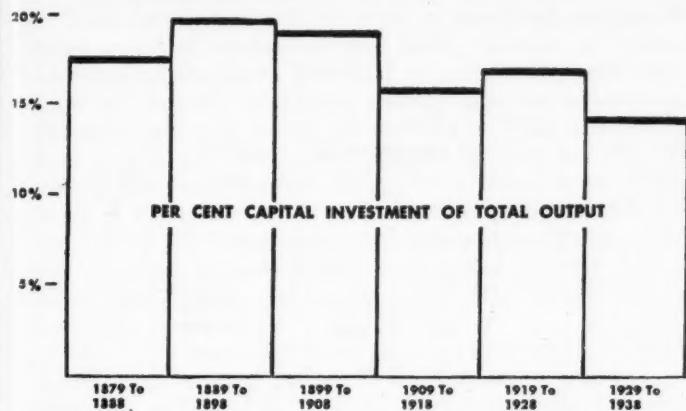
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OVER THE YEARS ABOUT 1/5 OF TOTAL OUTPUT IS PLOWED BACK AS INVESTMENT



ices provided merely to adequate levels. The 20th Century Fund estimates that the cost of a 15 year program to modernize our city streets and rural highways would run to \$40 billion. To bring the nation's housing up to minimum standards of health and decency by 1960 would cost \$115 billion. To conserve our natural resources and develop our water power would cost \$27 billion over a 15 year period.

There seems to be little question that needs exist for all the capital investment we can make for a long time to come. The behavior of investment in the past strongly suggests that the problem is not one of lack of needs but one of finding ways to add to our capital in an orderly fashion. Capital investment has followed the boom and bust route in the past; what is wanted is a high but steady rate of investment.

#### WARTIME INVESTMENT DEFICIT

Demand for capital goods is stronger right now than ever before, largely because of the backed-up needs arising out of the war. Here is how wartime expenditures for capital goods which can be used in peacetime production compared with expenditures in the last 5 years of both the 1920's and 1930's: (Figures in billions of dollars)

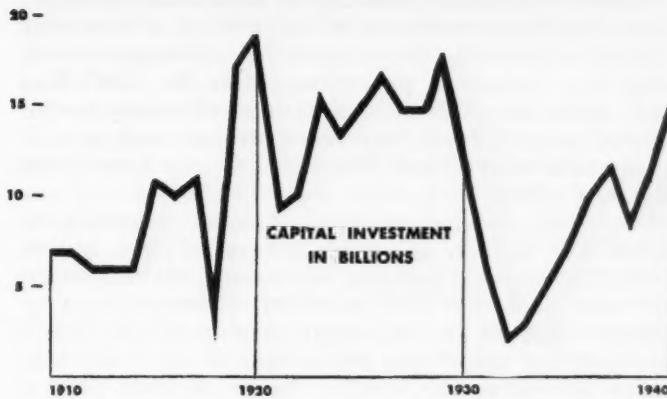
	1925-1929	1935-1939*	1940-1944
Total Capital investment	\$86	\$65	\$49
Industrial	51	43	32
Manufacturing	12	10	14
Metals, chemicals, machinery,			
petroleum	6	6	11
All Other	6	4	3
Commercial	10	5	3
Railroads	5	3	3
Electric power	5	3	3
Consumer Construction	28	14	12
Public Works	7	8	5

\* Adjusted to Wartime Prices

Wartime restrictions held investment in all civilian lines far below what would be spent in prosperous peacetime years. Thus, there was a backlog of investment needs at the end of the war which ran to more than \$30 billion, if the 1925-1929 demand can be taken as typical. Whatever the precise size of the backlog, it is clearly great enough, when added to the normal yearly demand for new investment, to keep the heavy goods boom going for some time to come. The test of our ability to stabilize capital investment will come later.

There is also a huge foreign demand for American capital. How far we will go toward meeting this depends largely on whether international political and

BUT THE AMOUNT PLOUGHED BACK VARIES GREATLY FROM GOOD YEARS TO BAD, ACCENTUATING THE SWINGS OF THE BUSINESS CYCLE



economic conditions are stable enough to make private foreign investment a good risk.

If we invest abroad in the same proportion we did in the late-1920's, our foreign investments will total \$1.6 billion during the year 1950 and \$1.5 billion in the year 1960. This will mean a net increase in our foreign holdings of \$15 billion during the 1950's, raising the total of such holdings to about \$25 billion, as against a total of \$10.6 billion in 1940.

To make that much foreign investment pay out, an expanding volume of world trade would be required. Foreign nations would have to get enough dollars not only to pay for goods they bought from us but also to pay interest and dividends on U. S. investments. If our overseas investments increase to \$25 billion by 1960, annual interest and dividends owed us will run to almost \$1 3/4 billion.

To pay us that much, foreign nations would have to sell much more in the U. S. than ever before. The 20th Century Fund calculates that imports of \$7.3 billion in 1950 and \$8.1 billion in 1960 would provide other countries with the dollars they need. Imports ran to \$2.5 billion in 1940 so we would have to buy 3 times as much abroad to keep expanding our foreign investments.

With good business, U. S. demand for imported goods should be well above prewar. Rising living standards will widen the market for such consumer items as British tweeds and French perfumes. Moreover, we will need to import more raw materials than ever before because we used up our natural resources at a prodigious pace during the war.

#### NEW INDUSTRIES

The new methods, materials, and products developed during the war may well have a more profound and lasting effect on future capital requirements than the backed-up demands accumulated in wartime. Here are some of the wartime developments which may have important peacetime applications: new chemical processes and products including synthetic rubber, plastics, synthetic fibers and fabrics; new food products and new methods of food processing; new uses for glass, plywood, and the light metals; tremendous advances in aviation; and new applications of atomic energy and fissionable products in power production and medicine.

Large capital expenditures will be required to push these developments further and adapt them to civilian use. New businesses and perhaps entire new industries will grow up, adding to the demand for capital goods for many years.

## THE COST OF GOVERNMENT

To the traditional certainty of death and taxes can be added the certainty that the cost of government will take a much larger share of national income than ever before in peacetime. After the Civil War and again after World War I, federal expenditures moved up to a level four times prewar. And it is already clear that World War II is going to have about the same effect.

In 1940, federal, state, and local governments spent \$19 billion, of which a total of \$2.2 billion went for national defense, veterans, and interest on the war debt. By 1950, the 20th Century Fund estimates that all governmental units in the U. S. will be spending more than \$45 billion. Federal expenditures are estimated at \$27.6 billion in that year as against \$9 billion in 1940.

Part of the increase is explained by higher post-war prices. Adjusting for price changes would reduce the 1950 figure from \$45 billion to \$33.5 billion. This is still 80% above the 1940 level. Increased expenditures for public works, social insurance, and schools explain another small part of the rise.

But costs arising out of the war are by far the most important factor. Military and veterans' expenditures and interest on the war-swollen national debt will add up to over \$17 billion in 1950. This is only 10% less than total government expenditures in 1940.

The only major category of government expense which would be lower in 1950 is welfare. With high-level employment and more social insurance, relief and other welfare costs should run to \$2.5 billion in 1950 as against \$3 billion in 1941.

The following paragraphs describe important trends in the major items of government expense.

### MILITARY

The 20th Century Fund assumes that we will maintain an armed strength of 2 million men (including trainees) and that it will cost \$3,300 to equip and maintain each man, so total military expenditures will run to \$6.6 billion. But even if we decide to maintain a smaller armed strength, the total cost might easily be at least \$6.6 billion because the present per serviceman cost of over \$6,000 a year may not decline.

AND  
GOVERNMENT . . .

### VETERANS

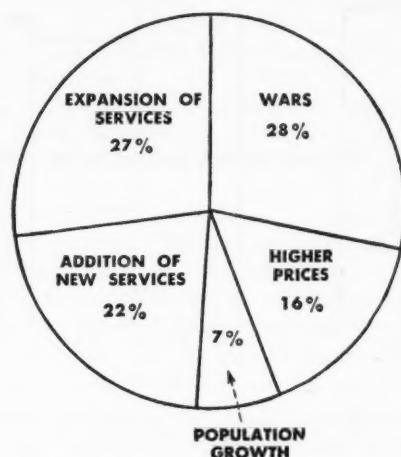
It will cost at least \$2.9 billion to take care of veterans in 1950 even if benefits are not increased. That's 5 times the 1941 cost. Pensions for World War I veterans rose steadily

from \$116 million in 1924 to over \$300 million in 1945. That rise will continue for another 20 years. By far the largest expense will be for World War II pensions which are already costing \$900 million. Disability and death benefits will cost about \$1 $\frac{1}{4}$  billion in 1950; hospitalization will add another \$250 million; and insurance \$150 million.

### SOCIAL SECURITY

Future expenditures for social security will depend on whether steps are taken to extend coverage and liberalize benefits. Over 60 million people are now covered so the cost is certain to increase rapidly as more of them begin to draw payments. With high-

WHY THE COST OF GOVERNMENT HAS INCREASED. The \$25.6 billion increase in cost from 1913 to 1941 was due to:



level employment in 1950, estimated old age and unemployment benefits under the present system would run to over \$5 billion. Expansion of benefits, as recommended by the Social Security Board, would raise the cost to over \$9 billion.

### PUBLIC WORKS

Even an economy-minded Congress is almost certain to go along with expenditures for highways, airports, waterways, flood control and conservation. Thus, an increase in expenditures for transportation and natural resources from less than \$2.5 billion to over \$5 billion in 1950 seems probable.

### SCHOOLS

Education ranks third among all government expenditures. In 1941 we spent almost \$2.5 billion—10% of all government dollars—on schools. Teachers' salaries account for almost three-quarters of the total cost so the trend towards higher salaries will boost the nation's bill for education.

### WHERE TAX DOLLARS GO

(Figures in Billions of Dollars)

	1913	1932	1941	(1944 Prices) 1950	1960
All Government Expenditures	2.5	12.4	23.1	45.5	50.7
Federal	0.7	4.3	12.9	27.6	28.6
State	0.2	1.8	3.6	7.0	9.3
Local	1.6	6.3	6.6	10.9	12.8
Military	0.27	0.7	8.1	6.6	6.6
Veterans	0.18	0.8	0.6	2.9	3.2
Interest	0.15	1.3	1.7	7.9	8.1
Social Insurance	—	0.2	1.9	7.7	8.7
Welfare & Health	0.31	1.5	4.1	4.0	4.1
Education	0.65	2.5	2.7	3.7	4.3
Public Works	a.	a.	a.	5.6	7.1
Transportation	0.40	1.9	2.0	1.8	2.7
Natural Resources	0.03	0.6	1.4	1.2	1.1
Police & Fire	0.19	0.7	0.7	1.0	1.1
Other	0.40	2.4	2.0	3.0	3.6

a. Included in other groups.

## NATURAL RESOURCES

The war left the U. S. with a depleted supply of most natural resources, and with critical shortages of some of the most essential minerals. Nevertheless, lack of natural resources should not be a limiting factor on our productive capacity. With relatively free access to world markets, we should be able to get all the raw materials we need. And, even if we were denied access to world markets, we could use our low-grade reserves and develop substitutes without causing a prohibitive reduction in our living standards, though everyone would feel the effects in one way or another.

The U. S. economy consumes about a billion and a half tons of raw materials each year, or about 11.5 tons per person. Of this 3.5 tons are coal, 1.5 tons are petroleum, and iron and copper ore each contribute about a half a ton. In 1939 the value of unrefined minerals output was \$4.2 billion and 2% of all workers were engaged in mining or lumbering.

## FUTURE REQUIREMENTS

The level of industrial production projected by the 20th Century Fund would raise minerals requirements a third above 1940 by the year 1950 and 50% above 1940 a decade later. Here is how natural resources requirements in the 1950 decade would compare with 1940 and the wartime peak: (Index numbers, 1940 equals 100)

	Wartime Peak	1950	1960
All minerals	138	133	151
Metals	157	117	126
Fuels	130	141	164
Other	141	128	142
Lumber	126	93	76
Electric Power	159	173	224
Manufactured Gas	120	94	75

The capacity of our supplies of natural resources to support future levels of output cannot be determined with any great accuracy. It will depend on the size of our reserves and on our ability to use supplies more economically and develop substitutes.

Because there is no way to measure these factors with any degree of precision, all estimates of the number of years' supply are subject to wide errors. However, such estimates are useful in directing attention at those resources where every effort should be exerted to develop new supplies, substitutes, and more economical methods of use.

## BIGGEST PROBLEMS: LEAD AND ZINC

Commercial grades of zinc, lead, and bauxite will be exhausted before 1960 even if the rate of use is cut to half the wartime rate. Supplies of petroleum and natural gas—which furnish 40% of our energy—will last longer than 20 years but their partial depletion will raise many technical and economic problems long before that time. Possible exhaustion of high-grade deposits of such minerals as iron and copper in the foreseeable future will stimulate development of processes to use low-grade deposits.

We have been discovering more and more ways to stretch our supplies of natural resources, however. In the case of tin, the electroplating process saves 50%

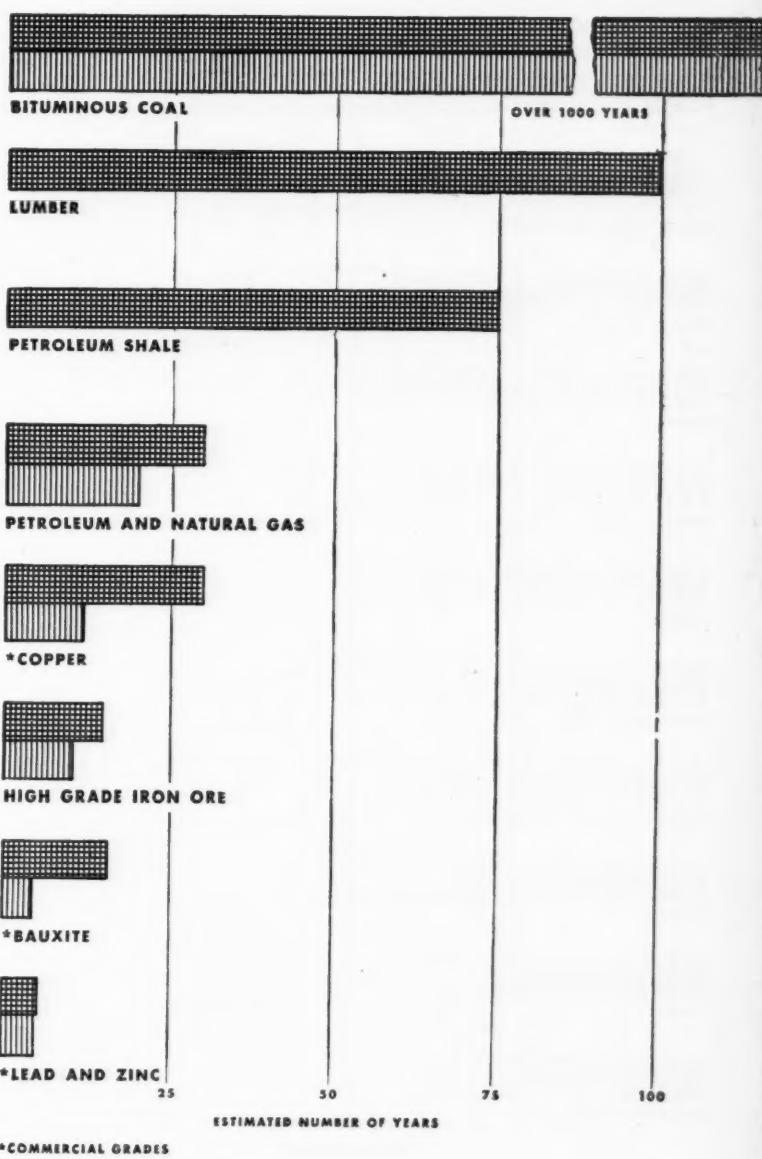
of the tin used in tinplate production. The electric power industry uses less than 40% as much coal per kwh now as in 1920. The development of new materials and new ways of using old materials also expands our resource capacity.

Our bituminous coal reserves are adequate for over a thousand years even at the wartime rate of use, though production costs might rise substantially as inferior coal beds were used. After that, there are huge deposits of sub-bituminous coal and lignite which could carry us along for another thousand years. In comparison, maximum petroleum reserves are minute, adequate only for about 30 years consumption at the current rate. That is why the experts are trying to find ways to produce oil from coal cheaply enough to be commercially feasible.

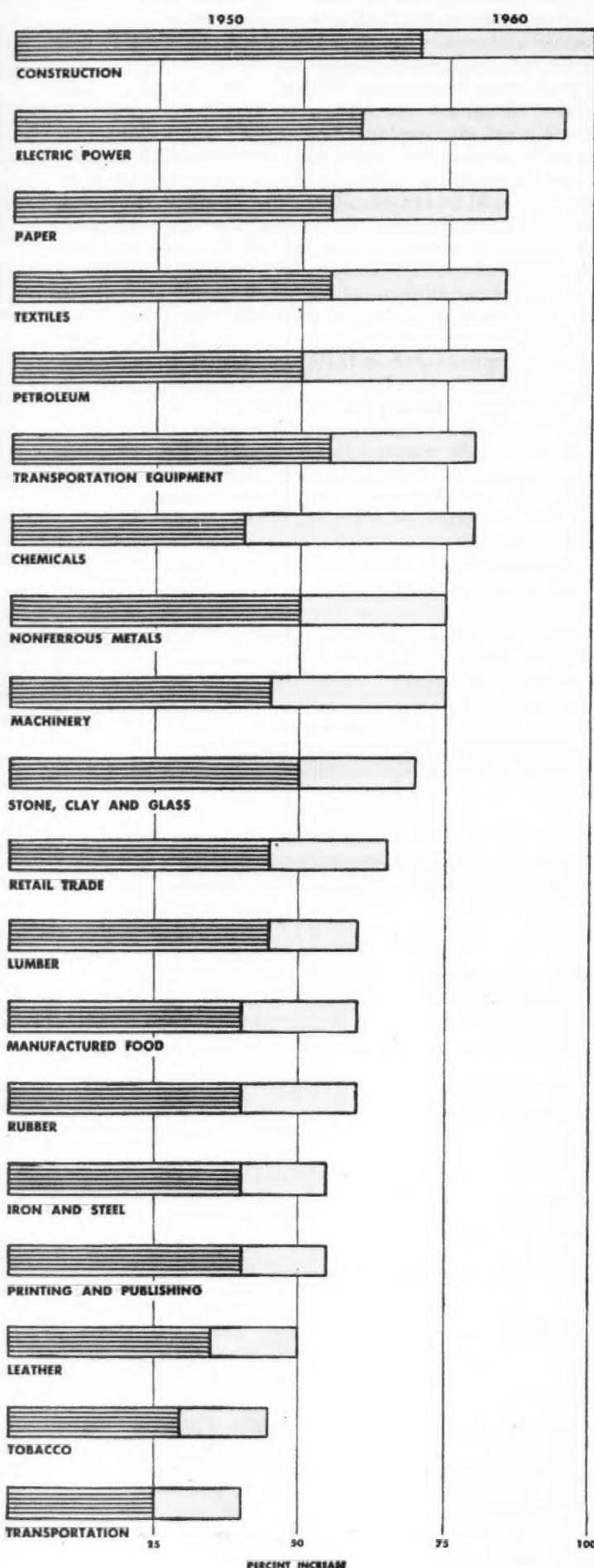
Even though we have been using up lumber faster than it grows, there is little doubt that enough will be available in the future to meet at least minimum needs. Annual timber growth runs to about 32 billion board feet. But we cut over 40 billion board feet a year before the war and lost another 6 billion through fire, insects, and disease. An adequate conservation program could increase annual growth enough to offset this depletion.

OUR NATURAL RESOURCE RESERVES  
Years required to exhaust supplies

1940 RATE OF USE  
WARTIME RATE



**PRODUCTION PROSPECTS: Estimated Percentage Increase in Industrial Activity Over 1940**



## INDUSTRIAL CAPACITY

At the end of World War II U. S. industry found itself with surplus capacity in some lines and serious deficiencies in others. There was more than enough aircraft, machine tool, and synthetic rubber capacity but not nearly enough sheet steel, copper, or electrical machinery capacity to meet pent-up demands.

War experience showed, however, that industrial capacity can be expanded enormously in a few years, given the need and the funds. Thus lack of industrial capacity should not prove a bottleneck to meeting the demands of consumers in the 1950 decade.

A rough estimate places our total investment in industrial facilities (manufacturing, mining, transportation, and distribution) at \$200 billion. Just how much capacity industry as a whole, or any given industry, has is impossible to measure.

Capacity is a most elusive concept. In a technical sense, the capacity of an industry is the combined production of all its plants working 24 hours a day, 365 days a year, less an allowance for repairs, breakdowns, and other technical factors. Actual capacity is far less, however. Some facilities are obsolete or high-cost. Supplies of raw materials and components may be insufficient to keep assembly plants running full-steam. Moreover, demand for many products isn't great enough to support round-the-clock production.

## PLENTY OF CAPACITY

During the past quarter century, however, experience shows that we have had more than enough overall capacity, and more than enough capacity in almost every industry, to meet all demands. An extensive study showed that even in 1929 only the steel and machine tool industries were definitely operating at capacity.

The growth of productivity as old machines are replaced with new and more efficient ones and as new techniques are developed is one of the main reasons why industrial capacity more than keeps pace with markets. The depression of the 1930's led to a net retirement of about 5% of total manufacturing facilities but manufacturing plants in 1939 could have turned out a quarter more than in 1929 because productivity was a third higher.

Whenever an industry's output begins to approach technical capacity, it becomes profitable to purchase new and more efficient equipment to replace or supplement existing machines so that a certain amount of excess capacity seems to be inevitable in a free enterprise system.

Estimates of the level of industrial production in different lines under conditions of high-level employment during the 1950 decade are shown in the chart. They assume that past trends will continue so that they give only a rough idea of what would happen to output in each industry. Unpredictable shifts of consumer demand or new product developments might cause a big change in the pattern of industrial production. Such estimates are, nevertheless, useful in that they provide a clue to lines where the largest increases may take place.

None of the projected increases are so large as to tax our ability to provide enough capacity. This is not to say that there will be no bottlenecks because of lack of capacity for certain components, for instance. However, we should be able to make good in short order any deficiencies of that sort that may develop.

## DEMANDS VERSUS NEEDS

Despite the substantial increase in living standards which would be possible with high-level production and employment in the 1950 decade, many U. S. consumers will be unable to buy enough of life's necessities to maintain themselves at a health and decency level. Almost 30% of all families would receive less than \$1,000 a year cash income and one-third of this group would receive less than \$500.

The 20th Century Fund asked a series of experts to estimate the quantities of food, clothing, housing, medical care, and other things needed to provide a standard of living at a minimum health and decency level. The experts also figured out how much it would cost to bring everyone expected to be below that standard in 1950 and 1960 up to the calculated level. In other words, the estimates show the cost of establishing a "floor" for consumption without disturbing the spending patterns of those who received more than enough income to satisfy the calculated minimum needs.

## ESTIMATES OF NEEDS

Any estimate of "needs" must rest upon someone's opinion as to what constitutes "health and decency" in this day and age. In the case of food, the nutritional requirements of a minimum health and decency standard can be determined accurately. In other fields, such as housing and education, even the experts would disagree over what constitutes a minimum standard.

However, what is important is not the precise size of the estimates but their general magnitudes. The conclusion that we would have to spend about 50% more on medical care than we are likely to in 1950 is important even if the experts' appraisals of the deficit range from as high as 60% to as low as 40%.

To fill total needs calculated in this manner would require production of \$200 billion of goods and services in 1950 or 13% more than the \$177 billion which would be turned out with high-level production and employment. In 1960, estimated production would fall short of needs by 8%. Food accounts for the biggest share of the deficit but needs outrun demand by important margins in housing, medical care, education, and social security.

To provide nutritionally adequate moderate-cost meals for those unable to afford them would add \$5.5 billion to the \$27.2 billion that would actually be spent on

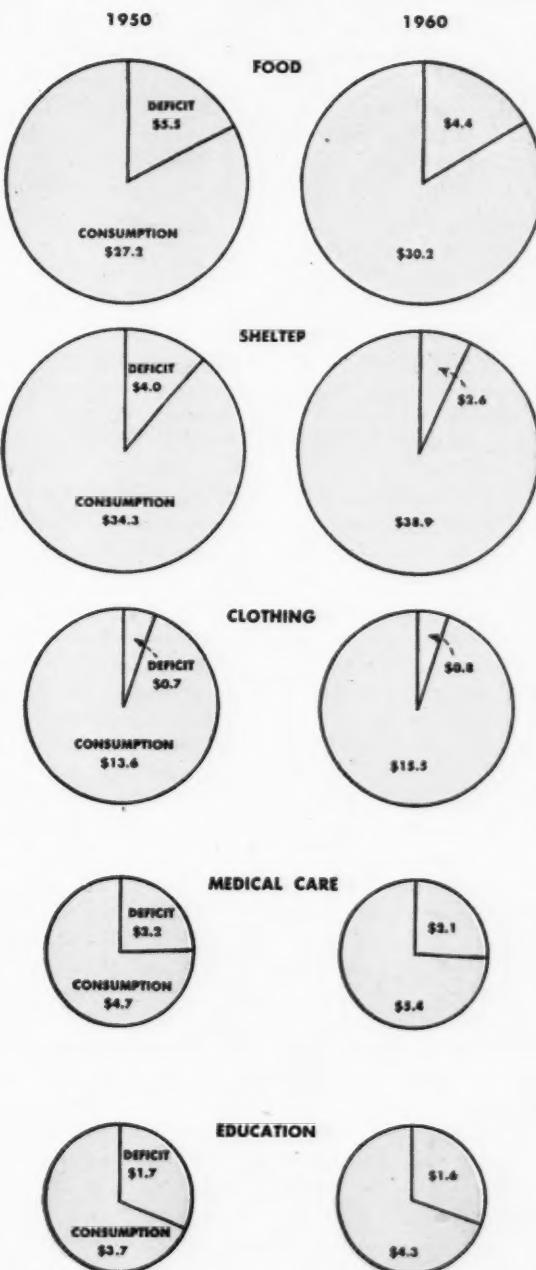
food in 1950. This assumes no change in diets of those with adequate incomes despite the fact that many people in those groups do not eat what they should. If we all ate what we needed, we would consume twice as many fresh vegetables as in 1940, half again as much milk, more fruits and tomatoes; and we would eat smaller quantities of sugar, sirups, fats, and oils. This better diet would cost us less than we will actually spend for food in 1950.

So large a portion of our existing housing is unsatisfactory by any reasonable standards that it would take 10-15 years to provide everyone with adequate housing. One of the reasons why we don't have adequate housing is that many consumers cannot afford to pay enough rent to finance it. Estimated expenditures in 1950 for rent (including the estimated rental

value of owner-occupied homes) would run to \$14 billion as against an estimated need of \$16.4 billion.

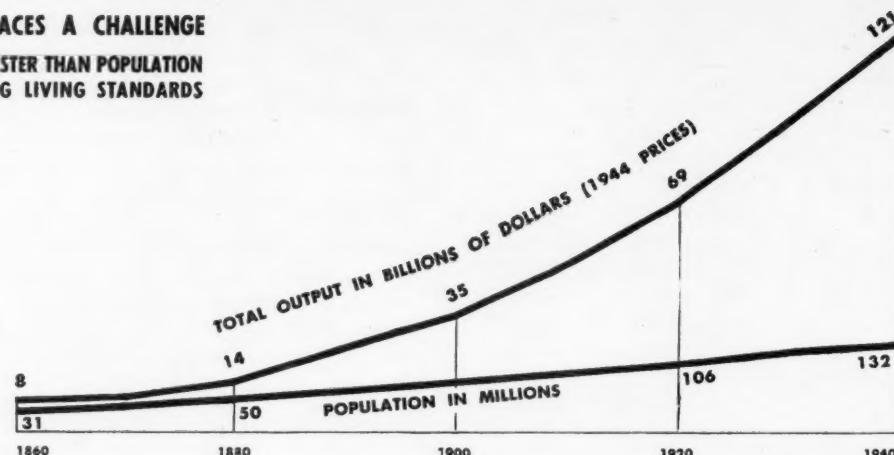
Vast advances in medicine have gone far toward eliminating many diseases and have brought about a steady improvement in the standard of health. However, large numbers of people in the lower income groups cannot afford adequate medical care. Moreover, to supply good medical care for everyone under the traditional fee-for-service basis would cost several times more than consumers have ever spent for medical services even in prosperous years. Development of an effective form of group medicine, however, would make it possible to provide adequate care at a great saving over present costs, according to the 20th Century Fund.

## HOW CONSUMPTION WOULD COMPARE WITH TOTAL NEEDS (Figures in billions of dollars)



## THE U. S. ECONOMY FACES A CHALLENGE

PRODUCTION HAS GROWN FASTER THAN POPULATION  
GIVING PROMISE OF RISING LIVING STANDARDS



The major conclusion of the 20th Century Fund's survey of America's needs and resources is that we have reached a point where we can provide everyone with a decent living and most people with a living which, by any standards other than our own, is positively luxurious. With high-level employment, it would take only a 13% increase in total output in 1950, and an 8% increase in 1960, to lift everyone to a minimum health and decency standard of living.

We have more than enough industrial and agricultural capacity to support that much of an increase in total production. Lack of natural resources should not be a bottleneck, for with world trade on any sort of a reasonable basis we will be able to get all the raw materials we need.

The only limiting factor is the capacity of our labor force to produce. The 20th Century Fund assumes that productivity will advance at the average rate actually achieved during the past 9 decades (18%). But there is no technical reason why we cannot achieve an increase of more than 30%. That would make possible enough production to meet our minimum needs.

The U. S. economy has exhibited two dominant characteristics in the past century. Our productive capacity has expanded at a rate never approached elsewhere. But our economy has also been highly unstable. Our problem is to make the most of our unparalleled technological and productive know-how while minimizing the swings of the business cycle.

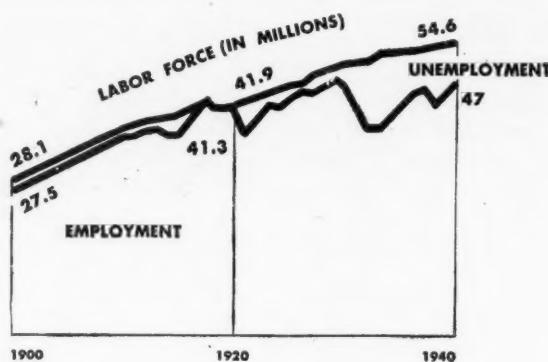
If we can meet that challenge, we can eliminate the specter of want and move on toward constantly rising living standards for everyone. Never before in history has a nation been so close to abolishing poverty and meeting the material demands of its citizens.

This is not to say that solving the problem of maintaining stable and expanding production would solve all our economic, social, and political problems. Nor is it to say that a solution of the problem of keeping our economic machine running on an even keel is at hand.

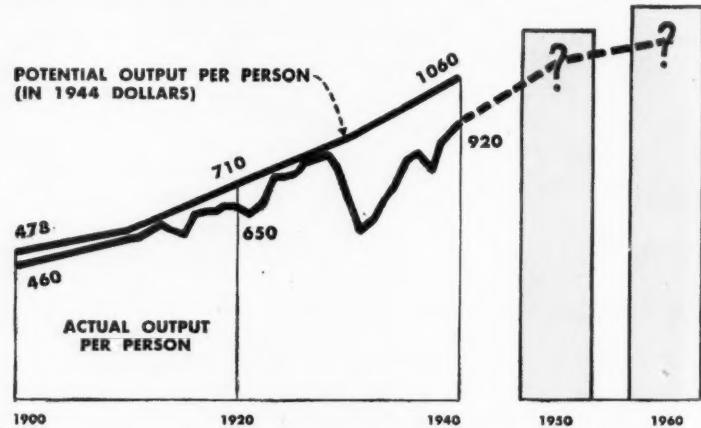
In the first place, the U. S. would not be a utopia even if we achieved the kind of high employment and production the 20th Century Fund is talking about. Many perplexing problems of how to best distribute our production would remain. Then there are a host of social and political problems which would still tax our efforts and ingenuity. Finally, there is the all-important question of how to maintain world peace.

Most people would agree that the problem of maintaining high employment and rising living standards is still far from solution. Our ability to mobilize and direct our economic resources so as to keep our

BUT THE GROWTH HAS FOLLOWED THE BOOM AND BUST ROUTE INVOLVING LONG PERIODS OF MASS UNEMPLOYMENT

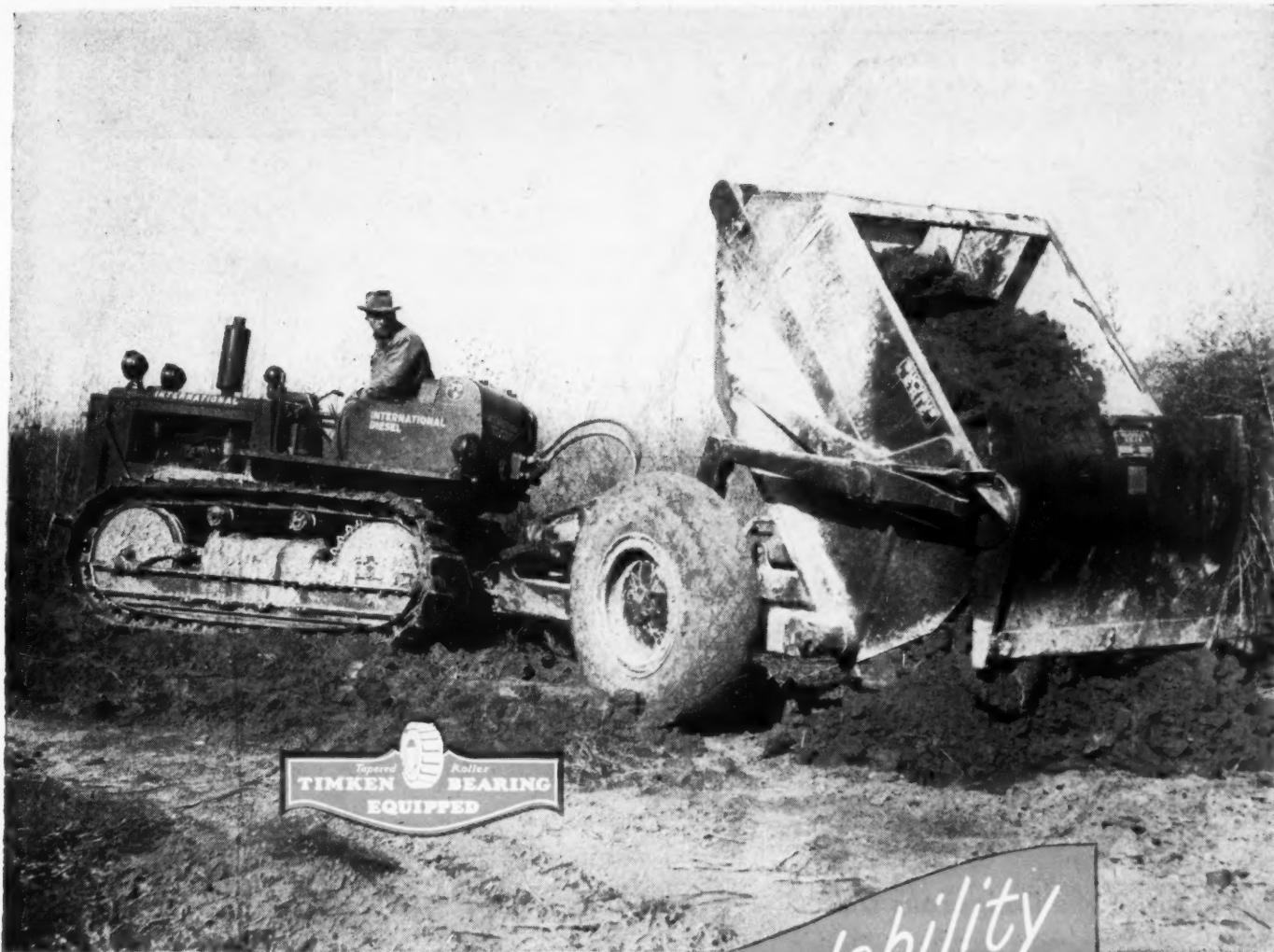


CAN THE ECONOMY PROVIDE STEADY EMPLOYMENT AND RISING LIVING STANDARDS?



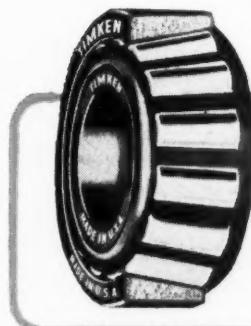
economy running on an even keel has lagged behind our ability to solve technical production problems. Each businessman, each worker, and each consumer must somehow learn to act differently in many ways than he has in the past if we are to solve our number one economic problem.

Just what changes in our economic life will be necessary no one knows. On our ability to find out these things and put them into practice in the next few years depends our success in meeting the challenge which the 20th Century Fund's study underlines. That challenge is that we have within our grasp the ability to eliminate actual want from the U. S. and to provide more and more things for better living for everyone.



## WHERE TIMKEN COUNTS

With two wheels providing all the support and furnishing the traction for this Bucyrus-Erie G-38 Scraper, the choice of wheel bearings easily might have made all the difference between dependability and undependability; between strength and weakness; between economical operation and uneconomical operation; between low maintenance cost and high maintenance cost.



*To be sure of getting the original, genuine Timken product, look for the trade-mark "TIMKEN" on every bearing you use.*

But the Bucyrus-Erie Company is bearing wise. They have used Timken Tapered Roller Bearings for many years; have proved that these bearings are masters of all loads — radial, thrust or both together in any combination; that they eliminate friction, defeat wear; and hold moving parts in correct and constant alignment.

This manufacturer's experience parallels that of thousands of others in all divisions of industry. Are you one of them? The Timken Roller Bearing Company, Canton 6, Ohio.

**TIMKEN**  
TRADE-MARK REG. U. S. PAT. OFF.  
**TAPERED ROLLER BEARINGS**

NOT JUST A BALL ○ NOT JUST A ROLLER ○ THE TIMKEN TAPERED ROLLER ○ BEARING TAKES RADIAL ○ AND THRUST ○ LOADS OR ANY COMBINATION



# LEGAL ADVENTURES OF TRACTOR CONN

By LESLIE JOBB



By recounting the experiences of Tractor Conn, who symbolizes the average contractor, this series of articles, each based on the decision of an American court and presented in plain, non-legalistic terms, is designed to help construction men avoid costly legal pitfalls.—Editor

## The Case of the Dangerous Delay



"I am inclosing herewith my check in full payment of my account, which I trust you will find in proper order," the owner wrote. Tractor Conn received the check after banking hours on Monday.

"Deposit the check as soon as the bank opens tomorrow morning," Conn ordered.

The bank sent the check to the clearing house. It was presented to the bank on which it was drawn on Wednesday and was unpaid, as the drawee bank had suspended business on Wednesday morning.

Whereupon Tractor Conn demanded payment from the owner.

"I paid my account by check," the owner protested.

"And the check was dishonored," Conn pointed out.

"If you'd presented the check within a reasonable time, as required by law, it would have been presented and paid on Tuesday, as I had ample funds to meet it when the bank suspended business," the owner contended. Tractor Conn sued and the Idaho Supreme Court ruled in his favor.

"When a check has been received after banking hours, deposited by the payee with his own bank on the next day, and presented by that bank to the drawee bank or the clearing house on the following day, the presentation is within a reasonable time, as required by the law," said the Court. There are New York and Pennsylvania decisions to the same effect, while the Nebraska courts have apparently ruled the other way.

## The Case of the Retained Percentage

Tractor Conn, according to a certain building contract, was to retain 25 percent of the contract price which he had agreed to pay a subcontractor to provide for possible liens and a creditors' assignee for the subcontractor had been appointed. The subcontractor represented that there were certain liens against the property and Conn paid them.



Then it appeared that the liens were not valid ones and the assignee demanded the 25 percent in Conn's hands.

"You had no right to pay the liens on his word without a court order or a judgment establishing the validity of the liens," the assignee argued.

"I paid in good faith," Conn pointed out.

"Makes no difference," the assignee maintained and the California Courts ruled in his favor in the case of Wilson vs Nugent, 125 Cal. 280.

## The Case of the Completion Certificate

Tractor Conn had completed his contract, as he contended, and sued for the contract price. The case was being tried when the following dialogue took place:

Owner's attorney: "Nothing is payable under this contract until the architect has given a certificate of completion."

Conn's attorney: "We offer this certificate in evidence."

Owner's attorney: "We say it is not a proper certificate of completion."

Conn's attorney: "And we say it is."

Owner's attorney: "We are willing to leave it to the jury."

Conn's attorney: "The jury has nothing to say about it. It is for the judge to decide."

Trial Judge: "Yes, it is a question for the judge." And the judge was right.

"The construction of the contract was a question for the Court and not for the jury," says the Massachusetts courts in laying down the rule.



**More Legal Adventures of  
Tractor Conn Next Month**



**"WE AGREE—  
FORD TRUCKS  
LAST LONGER!"**

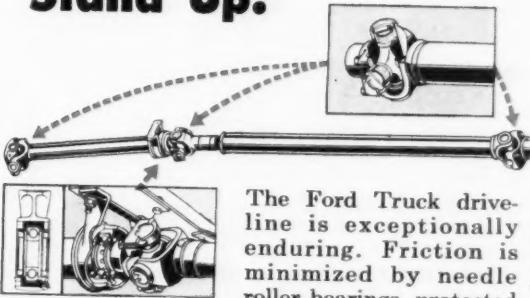
Mr. Robert S. Swanson, treasurer, S. B. Thomas, Inc., Long Island City, N. Y., wrote recently: "In our fleet of 128 Ford Trucks, 36 are over 10 years old, and 6 are 1932 models—14 years old! Their reliability and economy have given us good reason to be thankful that Ford Trucks Last Longer."



Tens of thousands of Ford Trucks have proved their endurance in the tough service of handling bulk building materials, ores, earth and coal. This 2-ton Dump Truck chassis carries a 3- to 4-yard heavy duty body and hoist by St. Paul Hydraulic Hoist Division of Gar Wood Industries, Minneapolis, Minnesota.

**ONLY FORD GIVES YOU ALL THESE LONG-LIFE TRUCK FEATURES:** Either of two great engines, the V-8 or the SIX, both with full pressure lubrication to all main, connecting-rod and camshaft bearings, Flightlight oil-saving 4-ring pistons, precision-type heat-resistant bearings and fast-warmup temperature control • rear axle design that takes all weight load off the shafts ( $\frac{3}{4}$ -floating in half ton units, full-floating in all others) • heavy channel section frames, doubled between springs in heavy duty models • big, self-centering brakes, with heavy, cast drum surfaces, non-warping and score-resistant—all told, more than fifty such examples of Ford endurance-engineering.

**ONE Big Reason—  
Ford Drive-Line Units  
Stand Up!**



The Ford Truck drive-line is exceptionally enduring. Friction is minimized by needle roller bearings, protected by relief fittings, in all universal joints in all models. Half-ton chassis have two such joints. All other models (except 101" w.b.) have three, and, in addition, a heavy duty ball center bearing. This bearing is self-aligning—cushion-mounted in live rubber. It is leakproof, excluding dust and water. It is unaffected by frame flexing and is notably long-lived. Large-diameter tubular steel propeller shafts with forged ends are properly balanced. This assures freedom from destructive vibration and great strength without excess weight.

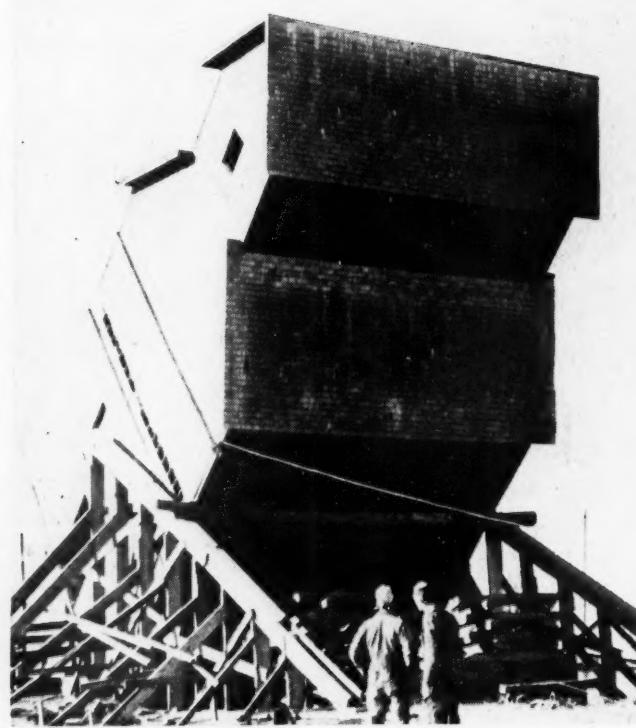


NATURALLY, FORD TRUCKS LAST LONGER! Latest 1946 registration figures show that 78% of all 1936 model Ford Trucks in use 9 years ago are still on the job! That's up to 15.8% better than the records of the next four sales leaders—5% better than the average of all four. More than 100 body-chassis combinations. See your Ford Dealer!

MORE FORD TRUCKS IN USE TODAY THAN ANY OTHER MAKE



SPRING IS IN THE AIR, and sidewalk superintendents, veterans and neophytes alike, swarm around a crane and clamshell outfit digging a hole on New York's Fifth Avenue. Wide World Photo



A GOOD IDEA, but it didn't work. To move this big grain elevator from Hastings to Muriel, Neb., contractor attempted to lay structure on its side by tipping it over against pole support riding on two ramps. Descent of pole down ramps was controlled by lines from two tractors. All went well until ramps collapsed, a moment after this picture was taken, dropping elevator on to timber cribs and caving in lower side. Wide World Photo

# JOB oddities

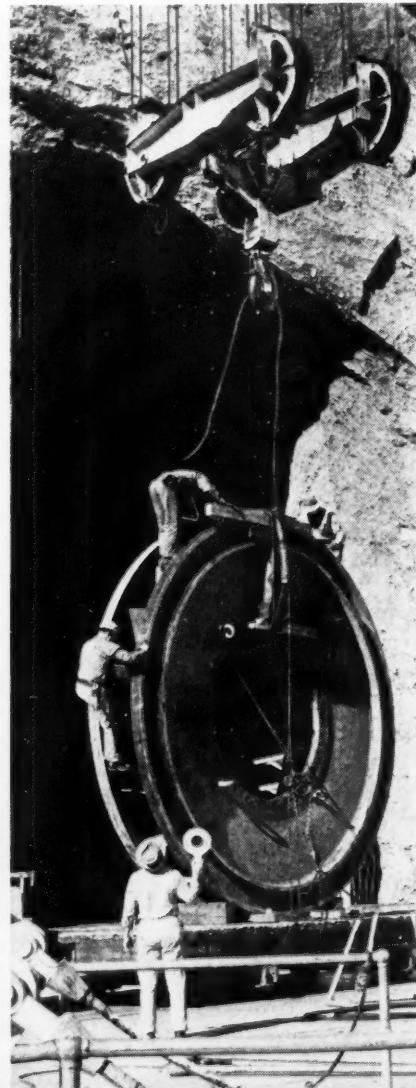
Page 116—CONSTRUCTION METHODS—May 1947

SCREENING AND CRUSHING PLANT (below) on south bank of Thames River prepares rubble from London's demolished air raid shelters for concrete aggregates for London County Council housing development. British Combine Photo



**UP FOR REPAIRS**  
Huge 35-ton 16-ft.-dia. turbine runner which is used as spare unit on Boulder dam powerhouse generators, is lifted from transfer car to canyon rim by overhead cable-way which spans river and deposited on tractor-truck, semi-trailer outfit for three-day trip to Los Angeles shops for reconditioning.

U. S. Bureau of Reclamation Photo



# RATES HIGH in all 7 Essentials

Not only in one, but in each of the seven desirable characteristics, **Atlas Mortar Cement** rates high with masons and contractors

**Outstanding in PLASTICITY**, Atlas Mortar Cement makes a fat, smooth, buttery mortar that promotes easier, faster handling—speeds work. It produces a superior YIELD—particularly important on large jobs. And VOLUME CHANGE rates high by being exceptionally low.

Proved STRONG and DURABLE by test, **Atlas Mortar Cement** complies with ASTM and Federal specifications for masonry cement. Its neutral COLOR

blends with masonry and with coloring matter in mortars. And its high WATER RETENTION is appreciated by the bricklayer and mason.

Whether for attractive interiors or for rugged exteriors subject to weathering, freezing and thawing, **Atlas Mortar Cement** is easy to handle—hard to beat.

Send for descriptive circular. Write to Universal Atlas Cement Company (United States Steel Corporation Subsidiary), Chrysler Bldg., New York, 17, N.Y.

OFFICES: Albany • Birmingham • Boston • Chicago • Cleveland • Dayton • Des Moines • Duluth  
Kansas City • Minneapolis • New York • Philadelphia • Pittsburgh • St. Louis • Waco

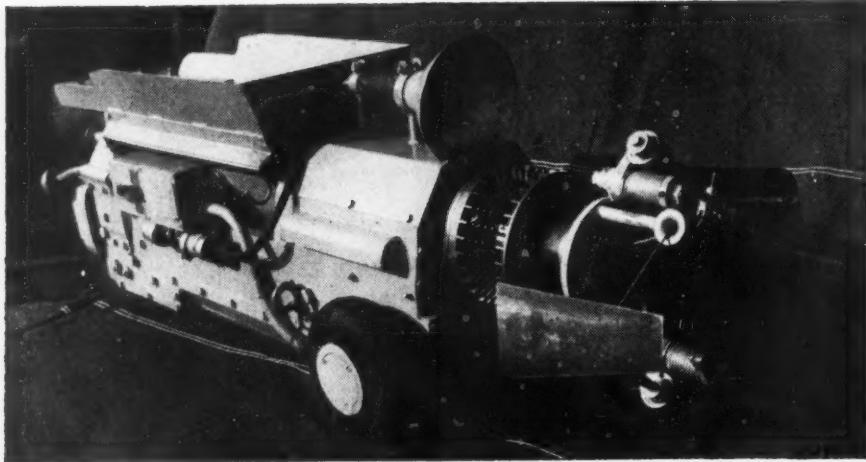
CM-MC-11



"THE THEATRE GUILD ON THE AIR"—Sponsored by U. S. STEEL—Sunday Evenings—ABC Network

# CONSTRUCTION EQUIPMENT NEWS

MAY 1947 REVIEW  
of Construction Machinery and Materials



**LINING 24-IN. PIPE**—Pipe as small as 24-in. dia. can now be concrete lined in place for any length. Concrete is applied centrifugally through a dispensing head that throws a measured amount of material per foot as the machine advances. Revolving trowels smooth

the concrete to give a hard finished surface resistant to tuberlation and electrolysis. A man rides a trailer with the machine. This machine is a compact counterpart of units used for pipes 84 to 30 in. dia. for the last few years.—Centriline Corp., 140 Cedar St. New York 6, N. Y.

**COMPACTION UNIT**—This unit of 100-ton capacity is equipped with five, 36-ply Goodyear earthmover tires—three on the rear and two on the front. This feature of design distributes the load equally on all tires and permits them to track in staggered formation. Officials of

**TIMBER GRIP**—Oliver timber grip, new device for use in laminated timber construction, provides simple means of preventing opening up or splitting and also for holding closed any timber already cracked or split. Grip consists of two interlocking steel members, inserted from opposite sides of timber in prebored hole. Using squeezing action or hammer blows, toothed ends of grip members engage. Grip will withstand a 5,000-lb. pull stress. Variation in widths of timber is accommodated since engagement of all teeth is not necessary. Forcing timber grip heads into surface prevents lessening of tension between two members even if shrinkage should occur after assembly. Head and swelled shank of grip provide effective seal against entrance of moisture. For laminated construction, grips are used as stitch bolts to hold separate timbers together. They fit timbers up to 12 in. wide.—Oliver Iron and Steel Co., Pittsburgh 3, Pa.



Guerin Brothers, San Francisco, contractor on the Clover Field project, where one of these units is now at work, are said to be enthusiastic about the efficiency, long wear and economy of the tires used on this equipment, and the manufacturer claims that new records have been established for speed and efficiency in compactions — The Southwest Welding & Machinery Co., Alhambra, Calif.

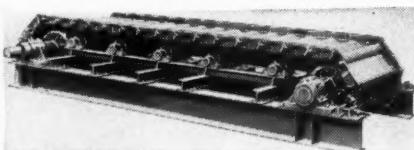
**TRAILER-MOUNTED COMPRESSOR**—Equipped with International Harvester gasoline engine, bore and stroke  $3\frac{1}{8} \times 5\frac{1}{4}$  in. and designed for work requiring quick handling to and from the job, this machine has



an actual air delivery of 105 cu. ft. Trailer-type mounting is provided with a Universal coupling or towing ring for connection to car or truck, for hauling at maximum speeds. Trailer mounting is in perfect balance so that it can be easily handled by one man.—Schramm, Inc., West Chester, Pa.

**CRANE DOOR-CLOSING ARMS**—Positive closing of swing type crane doors in industrial buildings is accomplished by use of powered closing arms. Accompanying this new development, series of mechanical and electrical interlocks insure that human element will not interfere with or cause damage to components in proper operation of door. In use, speed of door closing minimizes heat loss. In operation, lower door slides completely to right where it engages combination interlock, unlatching upper door which is then swung up into open position by means of six heavy-duty cables. In closing all operations are automatically reversed.—Fleming Steel Co., New Castle, Pa.

**MANGANESE STEEL FEEDER**—Pioneer-Oro manganese feeder combines brute strength and dependable service. Designed especially for tough jobs, this new feeder is constructed to handle efficiently and at high capacities large tonnages of abrasive or non-abrasive materials,



large lumps of broken stone at quarries and excavation projects and slag formations at steel plants. This manganese feeder can be secured in pan widths from 36 up to 48 in. and in lengths from 6 ft. 3 in. to 16 ft. 9 in. (center to center of shafts).—Pioneer Engineering Works, Inc., 1515 Central Ave., Minneapolis 13, Minn.

**WILL THE SAME  
CONVEYOR BELTING**

**HANDLE BARLEY, BRICK AND BRIMSTONE?**

**YOUR  
THERMOID DISTRIBUTOR WILL KNOW**

The price you pay for conveyor belting should be based on the service conditions it must meet. To get the belting that's just right for your work, consult your Thermoid distributor. Tell him what is to be moved and he will be able to specify the most economical belting for the job.

**He can also tell you—**

That Thermoid conveyor and elevator belting is carefully built for the service each is recommended and sold for. He will be able to tell you that impressive records of trouble-free operation have been made by Thermoid beltings largely because each type is designed and made with a thorough understanding of the wear factors in the service specified.

**He knows something about Thermoid too—**

Thermoid concentrates its manufacturing for industry on the well integrated line as shown below. The Company itself, while large enough to be thoroughly reliable, is still small enough to keep active contact with customers and their problems. That's one of the reasons why—

**IT'S GOOD BUSINESS TO DO BUSINESS WITH THERMOID!**

THE THERMOID LINE INCLUDES:  
INDUSTRIAL BRAKE LININGS AND  
FRICTION PRODUCTS • TRANSMI-  
SION BELTING • F.H.P. AND MULTIPLE  
V-BELTS AND DRIVES • CONVEYOR  
BELTING • ELEVATOR BELTING •  
WRAPPED AND MOLDED HOSE.





**FINEST DEVELOPMENT  
In Municipal Paving Units**  
**JACKSON**  
**ELECTRIC HAND SCREED**

**with PORTABLE POWER PLANT**

FOR MUNICIPAL PAVING OPERATIONS WHERE WIDTH OF SLAB VARIES, STREET AND ALLEY INTERSECTIONS ARE NUMEROUS AND OBSTRUCTIONS SUCH AS MANHOLES, SEWER OPENINGS, ETC., ARE ENCOUNTERED, THIS COMBINATION OF JACKSON EQUIPMENT TOPS ANYTHING PREVIOUSLY USED. And it likewise is ideal for paving HIGHWAY BRIDGE DECKS, HIGHWAY PATCHING and INDUSTRIAL FLOORS. Light weight, easily transported — easily operated by two men.

The screed, which tends to propel itself forward, strikes off and places any mix varying from 4" to 1/2" slump concrete and leaves the slab surface in ideal condition for finishing with minimum labor. Second pass if required is quickly made. Operators stand on hard ground — not in soft concrete.

**THE COMPLETE UNIT CONSISTS OF:**

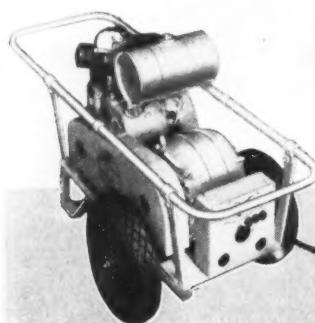
- 1 The Model SC-200A Screed for any width slab as specified from 8 to 20 ft. — activated by the famous Jackson Vibratory motor.
- 2 Jackson Type M-1 Portable Power Plant which provides a wide range of vibratory frequencies thus assuring perfect placement of any concrete mix usually specified. Also ideal for operating flood lights, internal concrete vibrators, drills and any other portable power tools within its capacity.

**The JACKSON M-1  
Power Plant**

Capacity: 1.25 K.V. Generates both single phase and 3 phase 110 Volt 60 Cycle AC power. Husky Wisconsin engine. Permanent magnet generator which has no brushes, rings or other small parts requiring adjustment or maintenance. Trouble-free.

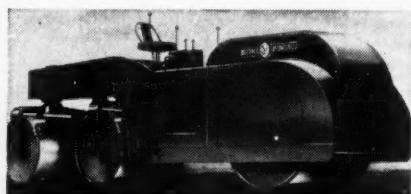
*By all means*

get the complete facts on this time and money-saving paving unit. Write, TODAY!



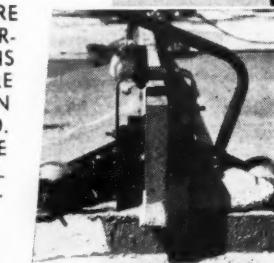
**ELECTRIC TAMPER & EQUIPMENT CO.  
LUDINGTON MICHIGAN**

**THREE - AXLE TANDEM** — New three-axle tandem roller, KX-25, incorporates in one roller many important features. It will have approximate metal weight of 12 tons



and ballasted weight of 18 tons. Wheel base will be shortened to give added maneuverability, while rolls will be widened to give increased rolling width.—Buffalo Springfield Roller Co., Springfield, Ohio.

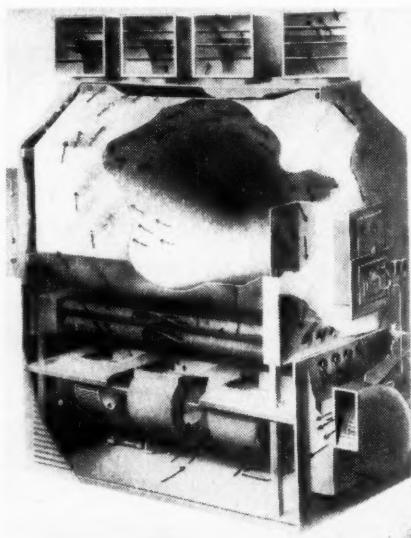
**DIRECT-FIRED HEATERS** — Development of stainless steel combustion chamber for commercial and industrial direct-fired Dravo heaters increases life expectancy of these heaters, since stainless steel has such high resistance to oxidation. Refractory lining, which has always been considered necessary with carbon steel, chamber construction, is completely eliminated in new type, making it lighter in weight and more



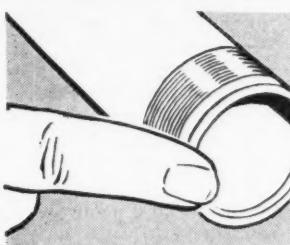
Operating Position Model SC-200A Screed



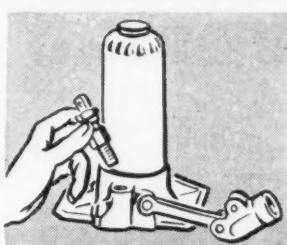
For Second Pass or Transportation Along Forms. The Screed is Elevated Clear of Slab.



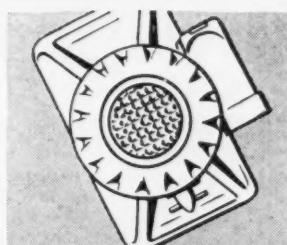
compact. Suspended heaters may be located in building roof trusses, either vertically or horizontally, depending on head room. In this type of heating, warm air is discharged horizontally over floor above workers' heads at flow rate of about 2,000 ft. per minute, enabling wide floor areas to be covered without use of ducts. Flow rate of returning air, coming from all directions, is so low that there is no appreciable draft. Eight different sizes have been developed, ranging from 400,000 to 2,000,000 Btu per hour. All are of the same basic design and are completely equipped with modern safety devices.—Dravo Corp., Pittsburgh, Pa.



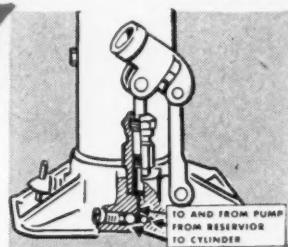
**1. LESS WEAR — LONGER LIFE!** Exclusive Blackhawk process creates "mirror finish" on cylinders, reduces cup wear.



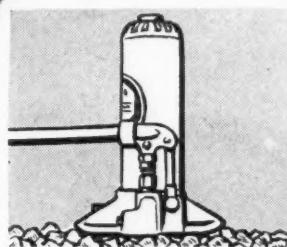
**2. LONGER PUMP LIFE!** Pump housing is not a casting but a smoothly machined steel cylinder. Reduces wear. Easily replaced.



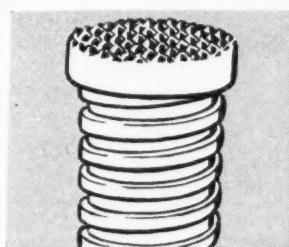
**3. TIP-PREVENTION!** Load is automatically centered and distributed evenly over base because plunger is dead center.



**4. EASY MAINTENANCE!** All valves under one cap screw (see cut-away). No dismantling of jack to clean valves.



**5. POSITION MORE EASILY!** Sled-type base "skids" over uneven ground or floor for quick placement under load.



**6. PERMANENTLY SHARP,** sure-grip heat-treated saddle. Serrations cut by machine (not cast or forged).



**7. FULL POWER ON THE SIDE!** Original Blackhawk pump-on-side feature permits horizontal floor-level operation. Handle extends outward, not down!

## Big Reasons why BLACKHAWK HAND JACKS GIVE YOU MORE FOR YOUR MONEY

Outward appearance is not the only indication of a jack's performance. It's the BASIC inner-difference in Blackhawk's design that assures you of continuous, safe, dependable performance in every emergency. When you need a jack — buy the best — buy a "Service Proved" Blackhawk from your Blackhawk Industrial Supply Distributor.

A Product of BLACKHAWK MFG. CO., Dept. J2357, Milwaukee, Wis.

This seal is found ONLY on  
BLACKHAWK HYDRAULIC JACKS — your  
assurance of a wise and safe investment.



# BLACKHAWK

# SONOTUBE COLUMNS

## Support Steel and Concrete



Detail showing reinforced concrete cap formed on top of Sonotube column supporting steel I-beam.

Showing heavy steel reinforcing going into position for pouring concrete floor supported by Sonotube columns.



Indicating size of area and Sonotube columns required to support floor carrying heavy machinery load.

*Lengths up to 24' to be hand sawn to pier or column heights*  
SIX STANDARD DIAMETERS

		INSIDE DIAMETER			
8"	9"	10"	11 1/4"	12"	13 1/2"
		SQUARE	INCHES		
50.26	64	78.54	100	113.1	144

Smaller Sizes Available

### IMMEDIATE DELIVERY

*Write for literature and delivered prices*

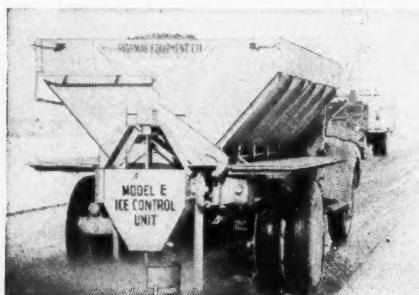
**SONOCO PRODUCTS COMPANY**

HARTSVILLE, S. C.  
ROCKINGHAM, N. C.

MYSTIC, CONN.  
GARWOOD, N. J.

LOWELL, MASS.

**HIGHWAY SPREADER**—Featuring speed, safety and versatility, new all-purpose highway spreader is designed to spread protective coat of sand or cinders quickly. Distributor disc is mounted low enough to highway to cast material low, ahead of rear wheels of truck. Spread may cover full width of either 2- or 4-lane



highway in one operation. Thickness and width of spread are easily controlled from driver's seat. Large hopper can be filled with material in advance and held in readiness for emergencies. Built in four lengths to mount on any truck chassis, Highway Model E is driven by power take-off from truck transmission. Protected drive gears operate in oil. This unit can also be used for dust control with calcium chloride in summer and for applying seal coats on oil. By removing distributor disk, it may be used for hauling crushed rock, etc.—Highway Equipment Co., Inc., Cedar Rapids, Iowa.

**LINE MARKER**—“Mark-Rite” line marker operates on gravity feed principle and requires no air pressure, hoses or electrical outlets. This hand-operated marker has self-cleaning valves, large wheels, and over-



size filler cap. Unit requires only five minutes to set up and another five minutes to clean. No straining of paint or lacquer is necessary. Unskilled labor can operate.—Universal Sales Co., 3062 West Main St., Alhambra, Calif.

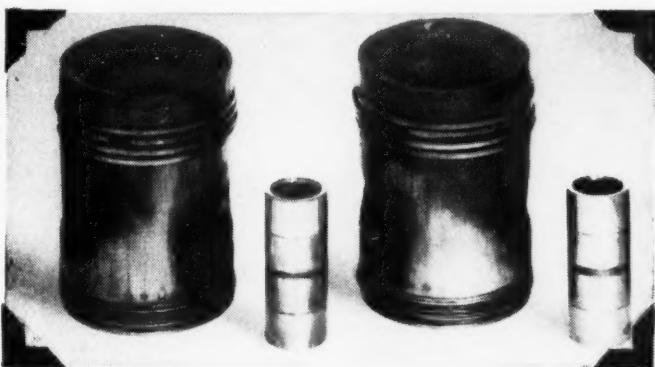
# STANDARD ENGINEER'S REPORT



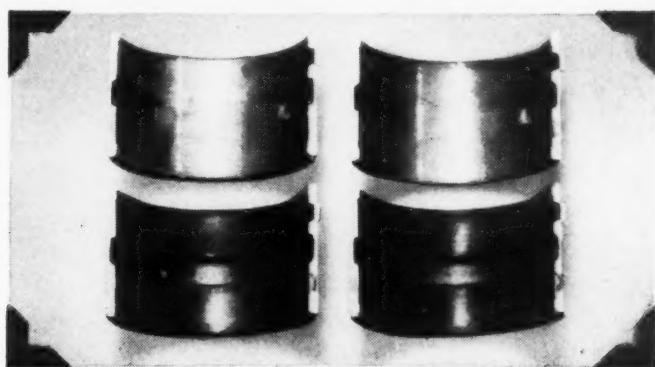
## TEST DATA

UNIT G.M.C. Diesel 6-71 Bus engine #6711367  
 LUBRICANT RPM Delo oil SAE 20 and  
RPM Heavy Duty motor oil SAE 30  
 MILES RUN 234,539  
 FIRM L.A. Motor Coach Lines  
 LOCATION Los Angeles

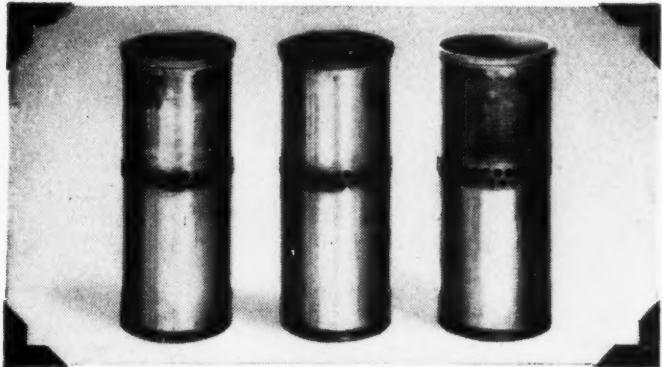
DIESEL BUS ENGINE RUNS 234,539 MILES ON RPM OILS  
 WITHOUT REPLACEMENT OF ANY PARTS



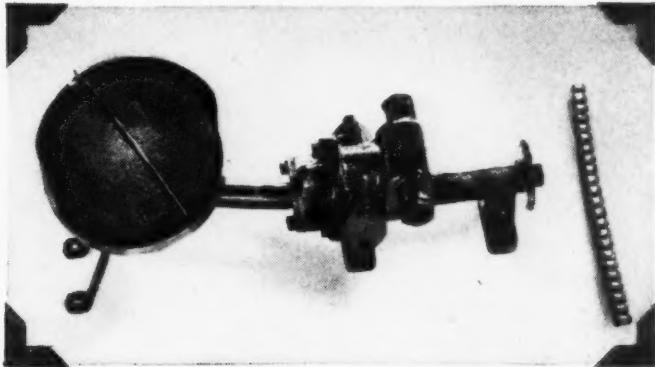
These pistons and pins came from a bus engine operated in city service for 234,539 miles on RPM Oils. As this photograph shows, they were unscratched and rings generally free. RPM Oils keep parts clean.



No cracks, pits or scoring appeared on main or connecting rod bearings. The highest wear measurement on any con rod journal was .0008"; on any main journal .0012". RPM Oils are non-corrosive.



All cylinders were smooth and varnish-free. Measurements on each showed wear from none to only .0035" near top of No. 4. No. 1 was .0013" out of round. RPM Oils stick on parts running or idle.



The oil-pump screen was clear of sludge and other foreign matter. RPM Oils are highly oxidation-resistant. Any sludge or loosened varnish and lacquer stay suspended and drain out with the oils.

**REMARKS** The test on RPM Oils ended at 234,539 miles without bearing failure or piston seizure. (The longest run on any other oil before failure was 177,000 miles.)

RPM DELO Diesel Engine Lubricating Oil SAE 20 was used for the first 66,000 miles of the test, RPM Heavy Duty Motor Oil SAE 30 for the last 168,539 miles. Both of these oils contain special compounds which clean varnish, lacquer and sludge from engine parts, prevent corrosion, resist oxidation and keep lubricant on hot and cold spots alike.

Trademarks, "RPM," "RPM Delo," Reg. U. S. Pat. Off.

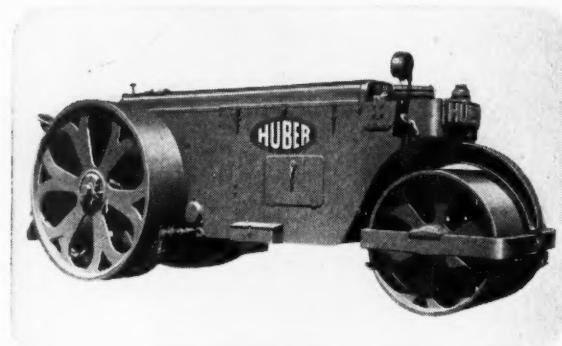
STANDARD OF CALIFORNIA • San Francisco, Calif.  
 THE CALIFORNIA COMPANY • Denver, Colo.

STANDARD OIL COMPANY OF TEXAS • El Paso, Texas  
 THE CALIFORNIA OIL COMPANY • New York

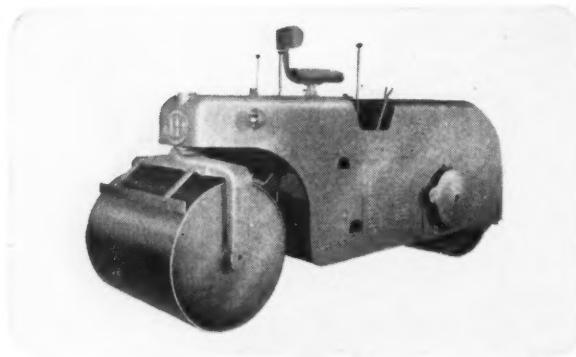


"YOU DON'T MEAN TO  
TELL ME YOU NEVER  
SAW HUBER ROAD  
MACHINERY IN  
*Action...*"

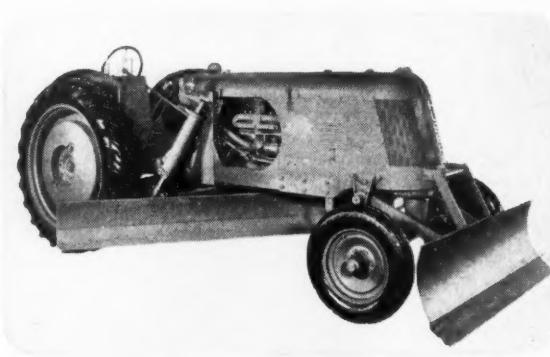
Speed . . . power . . . economy . . . all of the things you need to make Road Machinery a sound and profitable investment are built into Huber 3-Wheel Rollers, Huber Tandem Rollers, and the versatile Huber Maintainer to keep you on friendly terms with budgets. Huber Road Machinery is dependable because Huber knows how to build road machinery that incorporates all of the things you need to do a good job. Why not arrange for a demonstration through your Huber Distributor? He will show you what we mean.



HUBER 3-WHEEL ROLLERS  
Automotive type, built in sizes from 5 to 12 ton.



HUBER TANDEM ROLLERS  
Variable weight, built in sizes from 3 to 12 ton.



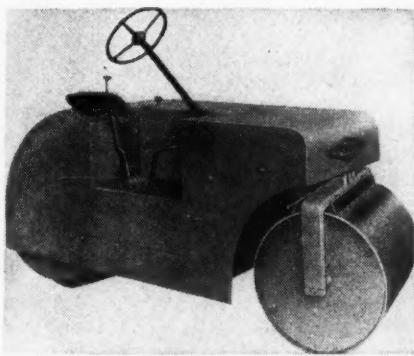
HUBER MAINTAINER—A versatile machine that also serves as a bulldozer, lift-loader, patch roller, snowplow, or rotary boom.

THE **HUBER** MFG. COMPANY • MARION, OHIO, U. S. A.

**HUBER**

3 Wheel • Tandem  
ROAD ROLLERS  
and  
MAINTAINERS

**TANDEM ROLLER**—A new tandem roller, Model 60, has plate and angle construction welded into exceptionally rigid unit. Streamlined housing completely incloses all operating mechanism. It has short wheel base

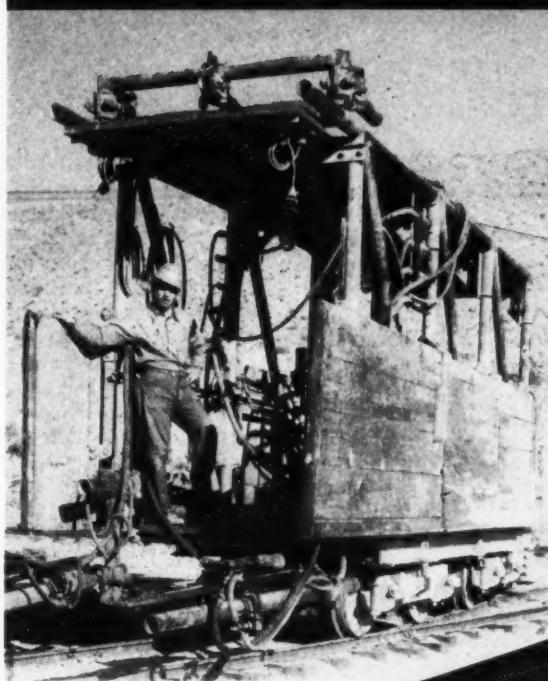


that permits maneuvering in close quarters and automotive type steering gear. Internal expanding band frictions permit instant change in direction travel. Total weight is 4,840 lb. empty, and 7,200 lb. when filled with water.—Clyde Iron Works, Inc., Duluth 1, Minn.

**ARC WELDING ELECTRODE**—Hardalloy, new direct current, reverse polarity arc welding electrode, provides weld metal which is highly resistant to impact or abrasive wear. Weld metal is capable of being heat-treated for machining or grinding and subsequently re-heat treated to restore it to its as-deposited hardness. Low-hydrogen electrode coating minimizes underbead cracking on hardenable steels. Weld metal fuses readily with base metal. It is available in five sizes from 3/32 to 1/4 in.—The McKay Co., 1005 Liberty Ave., Pittsburgh 22, Pa.

**TIES AND FORMS**—Plain coil of wire, cut in required lengths, is important factor in assembly of Bulldog forms. No twisting of wire, nailing, bolting or wedging is necessary. Grip tool, manufactured of highly durable material, will make grips in any position. Ties, which can be locked at any angle, will assemble forms and act as positive spreader with aid of Bulldog tool. When pouring is in progress, wire offers no resistance to free flow of concrete. When forms are stripped, tie wires can easily be taken out altogether, if desired. All-steel forms have perfectly square butt joints, thus leaving smooth walls that require no finishing. Plywood-faced forms, which also have square butts, are outlined by sturdily constructed steel frame. Erection time is said to be 10 sq. ft. per minute.—Bulldog Concrete Form Corp., 100 W. 42nd Street, New York 18, N. Y.

# "ALLGOOD CORD"



A Goodall "Standard of Quality" Product . . . your assurance of unsurpassed reliability and value.



## Goodall's Finest LARGE SIZE AIR HOSE..

Built especially for tunnel and caisson work, where safety is an important requirement.

Contractors know that Goodall's finest means second-to-none, in quality, reliability and long-life economy. And where safety is an added factor, any hose with the famous Cloverleaf trademark can be counted on to provide full protection to the men who use it.

"ALLGOOD CORD" is kinkproof, and built to insure exceptional resistance to high pressures, constant dragging over rock, concrete, etc., and blows inflicted by falling objects. You can be sure it will stay on the job longer.

• • •

Other Goodall products for contractors include additional types of air hose; steam, water, suction, concrete placing and hydraulic hose; conveyor and transmission belting; waterproof clothing and boots.

Contact Our Nearest Branch for Details

**GOODALL**  
RUBBER COMPANY - INCORPORATED

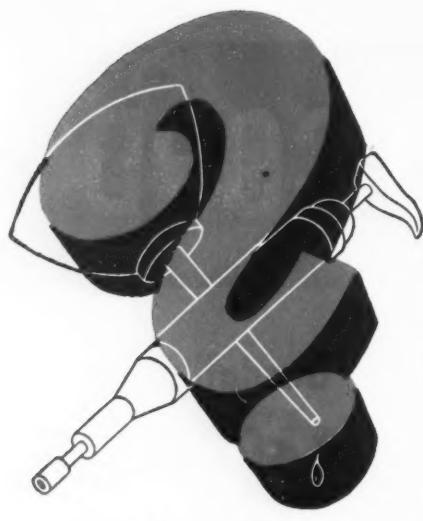
THE GOODALL-WHITEHEAD COMPANIES

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Established 1870



## GREASE OR OIL

The question of selection of the proper type and consistency of lubricants need offer no problem. LUBRIPLATE Lubricants are available from the lightest fluids to the heaviest grease types. All reduce friction and wear, protect against rust and corrosion, and are more economical than conventional lubricants. Let us prove our case.

**Rx FOR YOUR MACHINERY**

- No. 2 — Ideal for general oil type lubrication, ring oiled bearings, wick feeds, sight feeds and bottle oilers.
- No. 8 — Because of high film strength and long life it reflects outstanding performance in most types of enclosed gears (speed reducers).
- No. 107 — One of the most popular grease type products for general application by pressure gun or cups.
- No. 70 — For a wide range of grease applications, especially at temperatures above 200 degrees F.
- No. 130-AA — Known nationwide as the superior lubricant for open gears, heavy duty bearings, wire rope, etc.

**BALL BEARING** — This is the LUBRIPLATE Lubricant that has achieved wide acclaim for use in the general run of ball and roller bearings operating at speeds to 5000 RPM and temperatures up to 300 degrees F.

**LUBRIPLATE**  
FISKE BROTHERS  
NEWARK 5, N. J.  
REFINING CO.  
TOLEDO 3, OHIO

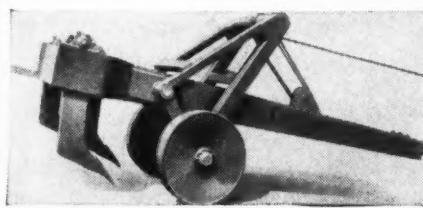
DEALERS FROM COAST TO COAST  
CONSULT YOUR CLASSIFIED TELEPHONE BOOK

**BALL BEARING TAKE-UP** — Steel frame take-up for conveyor service incorporates Dodge SC ball bearing take-up unit consisting of ball bearing inner unit inclosed in cast iron housing provided with ways on each side of supporting guides. Housing has hole for receiving unthreaded end of adjusting screw. Take-up has welded steel frame so designed as to afford ample strength and ri-



gidity without excess weight. Adjustment is accomplished by turning brass capstan-head nut. Adjusting screw is cadmium plated. This take-up is equally strong in tension or compression. It is available in shaft sizes from  $\frac{3}{4}$  to  $2\frac{7}{16}$  in. Company also announces new ball bearing flange bearing, which is fully self-aligning, has deep groove precision ball bearing with long inner race, improved labyrinth seals and is suitable for mounting against vertical or horizontal frames and supports. Back face of housing is machined and filling slots are also at back which provides added protection against external dust and dirt.—Dodge Mfg. Corp., Mishawaka, Ind.

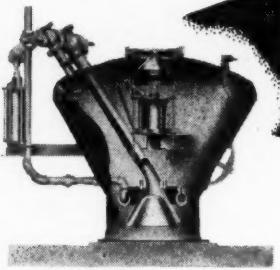
**CABLE-OPERATED RIPPERS** — Built in two sizes, known as No. 28 and No. 18, these rippers are rugged machines. No. 28 is built for use with one or two D8 tractors; No. 18 for use with single D7 or D8 tractor. Both models are equipped with three teeth which are detachable when less than that number are required on job. Replaceable tips of teeth are of heat-treated alloy. While maximum depths of



penetration are 28 in. for No. 18, and 30 in. for No. 28, accurate control permits operator to rip material to any depth up to maximum. Proper tooth angle and weight distribution give penetration on hardest materials. Rippers are operated by rear cable control on tractor. Sheaves are  $9\frac{1}{2}$  in. in diameter and 80 ft. of  $\frac{1}{2}$ -in. cable is required for operation. Wheels of rippers are of steel drum type. Approximately shipping weights of No. 28 and No. 18 are 13,000 and 9,500 lb. respectively. Removable cover plates are provided in frames to permit filling with sand or other materials which will increase operating weight of each model approximately 2,200 lb.—Caterpillar Tractor Co., Peoria, Ill.

## WHAT EVERY LARGE CONTRACTOR SHOULD HAVE

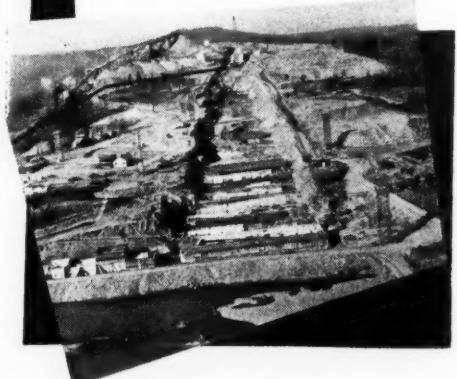
**THE Robinson System  
FOR MOVING BULK  
CEMENT FROM SIDING  
TO MIXING PLANT . . .**



Why should he have it? Because numerous installations have shown that it is the cheapest way to handle cement in bulk over relatively long distances . . . because it is a simple layout with no moving parts to get out of order or to cause heavy maintenance . . . because it operates on relatively low air pressure . . . because it can be readily dismantled, stored, and set up on a new job.

If you are operating on large contracts which call for handling a considerable tonnage of bulk cement, you should look into the merits of the Robinson System. You should have one or more units in your "stable" just as you have trucks, bulldozers, cement mixers, etc.

Write for further information.



## ROBINSON Air-Activated CONVEYOR SYSTEMS

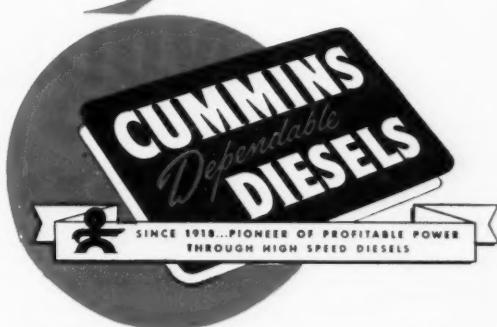
Division of MORSE BOULGER DESTRUCTOR CO.  
211-C E. 42nd St. New York 17, N. Y.  
Representatives in Principal Cities

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For any application in the 84 to 275 hp range, there is a proved Cummins Dependable Diesel that will maintain higher average output over a wide variety of changing load conditions.



CUMMINS ENGINE COMPANY, INC. • COLUMBUS, INDIANA

## REALIGNING A RAILROAD BED —Through TOUGH Glacial Deposits



FOLEY BROTHERS INC., ST. PAUL AND MARSCH-PETERSON CO., OMAHA; RR CONTRACT WESTERN NORTH DAKOTA.

*—with a fleet of Wooldridge Terra-Cobras*



WOOLDRIDGE TERRA-COBRA employ the same  
Bowl features as Wooldridge "Terra-Clipper"  
tractor-drawn Scrapers

### Measure Each Job in terms of WOOLDRIDGE EQUIPMENT:

- ★ High Speed EARTHMOVERS
- ★ Tractor-drawn SCRAPERS
- ★ BULLDOZERS
- ★ TRAILBUILDERS
- ★ RIPPER
- ★ POWER CONTROLS

WOOLDRIDGE MANUFACTURING CO.  
SUNNYVALE, CALIFORNIA  
NATIONWIDE SERVICE

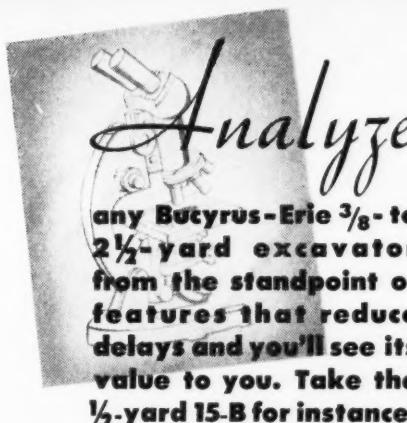
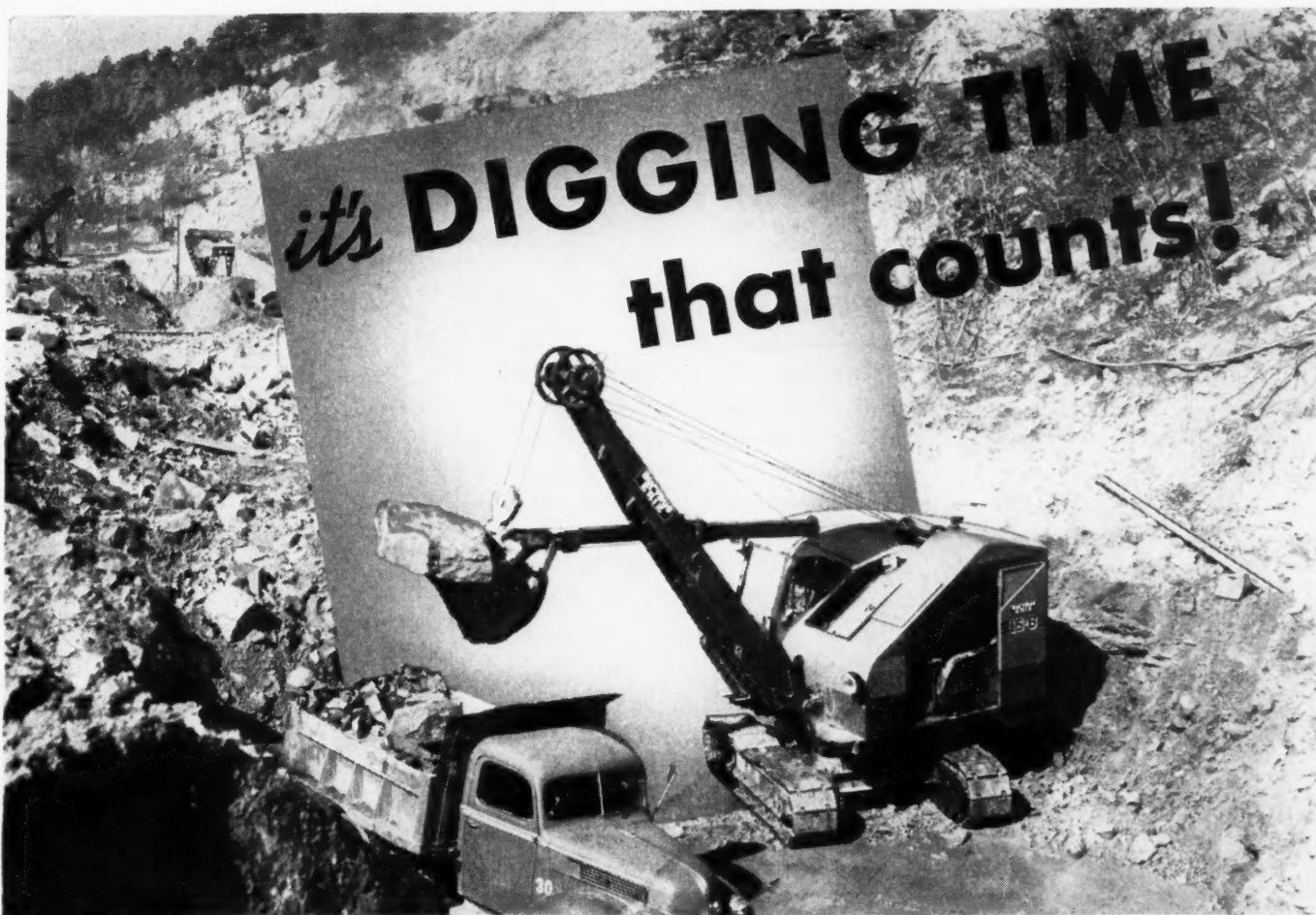
Across 16.6 miles of North Dakota's ruggedest terrain, a new roadbed for the Northern Pacific Railway has been carved through lignite and hard vitrified scoria. A sizable portion of the 3,750,000 cubic yards of glacial deposit was handled by a fleet of nine Wooldridge high-speed, heavy-duty Terra-Cobras. These units were frequently given the toughest assignments in the hardest cuts. Compaction was effected by routing the heavily loaded units over varied portions of the haul road and fill. To keep your earth costs down to rock bottom, investigate Wooldridge Terra-Cobras, today.

# WOOLDRIDGE

TERRA COBRA

HIGH SPEED-SELF PROPELLED

EARTHMOVERS



**MOBILITY:** The 15-B is easy to steer in sharp or gradual turns and there's plenty of power to climb grades up to 30%. Time spent in moving is cut to a minimum.

**MATERIALS:** Only controlled-quality materials, properly treated, are used.

**WEIGHT:** The lightest weight consistent with ample strength is maintained throughout so that stresses on all parts of the machine are kept at a minimum. The 15-B, like all other Bucyrus-Eries, is individually designed for its work.

**PERFORMANCE:** The smooth, quiet performance of the 15-B—obtained with widespread use of anti-friction bearings, oil enclosed gears and accurate alignment—means less maintenance, reduces operator fatigue, and increases digging time.

**ADJUSTMENTS:** All adjustments, including singlepoint adjustments on clutches and brakes are easily made and stay put for long periods.

**ACCESSIBILITY:** Parts are large, simple, few in number, easy to get at for replacing. Lubrication fittings are easy to reach, hard to miss.

**CONTROL:** All operating levers, including lever for positive digging lock, are grouped at the operator's position. There are no time-wasting delays caused by the operator's having to leave his normal position.

**CYCLE:** All functions are balanced and synchronized so that there is no overstressing of any part or parts to cause too-frequent adjustments and excessive wear.

64E46

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most of  
**EVERY HOUR**  
with a  
**BUCYRUS-ERIE**

**BUCYRUS-ERIE COMPANY • SOUTH MILWAUKEE, WISCONSIN**

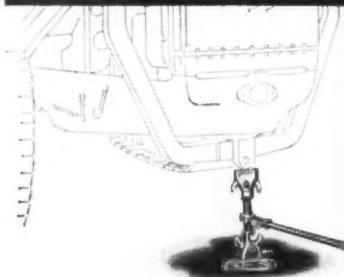
**JOBs LIKE THESE**  
are "Naturals" for  
**Simplex**  
**UTIL-A-TOOL**



**It Pulls Wheels**



**It Clamps and Holds**



**It Lifts and Lowers**



**Simplex**  
LEVER - SCREW - HYDRAULIC  
**Jacks**

**TEMPLETON, KENLY & CO.**  
1008 South Central Avenue, Chicago 44, Illinois

The most striking feature of the Simplex Util-A-Tool probably is its versatility. It handles all sorts of troublesome production, installation, maintenance and repair jobs with such cost-cutting speed and efficiency that time and labor savings on a single job often return more than its full cost.

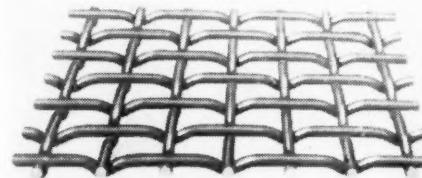
Packed in a sturdy metal box not much larger than a mechanic's tool kit, a Util-A-Tool is readily carried anywhere in the plant or in the field. Men who have given the Util-A-Tool a real workout call it "*The Tool of a Thousand Uses*". It pulls. It pushes. It spreads. It bends. It clamps. It holds. It lifts. The fastest universal wheel puller yet devised—it's equally efficient in pulling gears, pinions and bushings.

Order a Simplex Util-A-Tool today. Check the time and money it saves you in 30 days and let the results decide whether you can afford to be without a duplicate kit in every busy department of your plant or field operation.

**ALL THIS IN ONE  
HANDY KIT**

- Three  $\frac{1}{2}$ " x 40" chains with grab hooks and claws
- One lever bar
- One Spreader Jack
- One 3-way base and wheel puller
- Two sky hooks
- One push-pull screw jack
- One metal tool box (not shown)

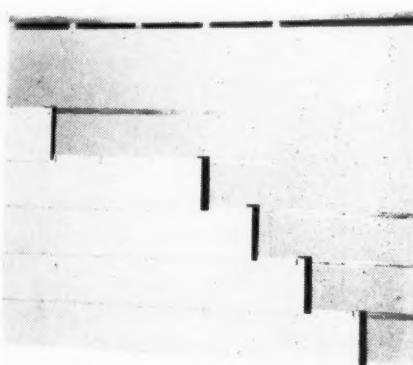
**AGGREGATE WIRE SCREEN—**  
Roe-Flat is designed to provide maximum metal surface exposed to abrasive wear usually encountered where this type of screen is used. Its flat surface evenly distributes



wear, increasing screen life up to 90 percent above conventional type screens, and permits even, smooth flow across screening surface. Its smooth top practically eliminates spreading of wires and breaks usually caused by backing screens with uneven surfaces. — **John A. Roebling's Sons Co., Trenton 2, N. J.**

**PLASTIC - TYPE COATING** — New type of black, cold-applied protective coating with many unusual properties is known as Bituplastic. It is dispersion in water of highly refined plastic coal tar pitch and other finest quality materials. Because of its unusual composition it can be applied to damp surfaces whether metal, concrete or masonry, by brush or spray, drying quickly by evaporation. It is virtually incombustible and is actually fire retardant. — **Wailes Dove - Hermiston Corp., Westfield, N. J.**

**SIMPLE HANGERS** — Known as Lox-On, these hangers consist of 26-gage galvanized clips and permit fastening cement-asbestos shingles to non-wood siding without nailing. Strips are nailed in horizontal



position, two strips holding row of shingles at top and bottom. Clips, snapping over strips nailed in place in advance, hold top of one row next shingles and bottom of row next above. — **Nugent Roofing & Supply Co., 15 N. W. Riverside Dr., Evansville, Ind.**



**A**RE YOU trying to get along with trucks that are un-economical to operate?

Are your costs high as a result of trucks that don't fit your particular hauling needs?

If so, you're probably considering replacing your equipment with trucks that really fit your job, save you money!

It stands to reason that a truck that fits your loads and operating conditions—will give better performance, better service to your customers, and operate at lower cost.

To give you exactly the right truck for your loads . . . over your roads . . . Dodge builds 175 different "Job-Rated" chassis models.

In each, you get exactly the right one of 7 engines—to give the pulling power you need with the economy you want.

You get exactly the right one of 5 clutches, 4 transmissions, 18 rear axles . . . the right springs, brakes, and other chassis units . . . for "top" performance, longer life.

To make sure that your next truck is "Job-Rated" to fit your job, see your Dodge dealer . . . because *only* Dodge builds "Job-Rated" trucks!

**DODGE DIVISION OF CHRYSLER CORPORATION**



**ONLY DODGE BUILDS "Job-Rated" TRUCKS**

**DODGE**  
"Job-Rated" TRUCKS

**Fit the Job . . . Last Longer !**

# 5 YEARS DEVELOPMENT

ON FIELD TESTS  
IN EVERY TYPE  
OF PROSPECTING  
AND STRIPPING  
THROUGHOUT  
THE WORLD.



The Parmanco Single Speed Transmission Drill is designed to meet the requirements of the general prospecting field where it is not necessary to drill in solid limestone. Special sliding frame permits drilling and pulling of augers without moving drill. New design of chuck eliminates all hand operation in raising power plant. Recommended for 50 to 60 feet with four and one-half inch equipment. Under favorable conditions it is being used to greater depths.

**PARIS MANUFACTURING COMPANY**  
**PARIS, ILLINOIS**

**AUTOMATIC BLUEPRINTER**—New Revolute M4 utilizes revolving contact principle for providing slip-free contact between tracing and sensitized material. Contact is achieved through use of Pyrex glass cylinder, with light source remaining station-



ary while cylinder revolves. Other features of blueprinter includes quartz lamp; aperture control; high speed; simplified feeding and central controls; double chemical applicator; thorough washing; temperature control; paper tension; concealed air dryer; and nested drum dryer.—  
**Paragon-Revolute Corp., 77 South Ave., Rochester 4, N. Y.**

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**✓ STSALKRAFT**  
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THE SISALKRAFT CO.  
CHICAGO, ILLINOIS

# *Mountains of* **PROFITABLE "AGLIME"**



"Universal 'Stream-Flo' crushing plant produces 275,000 tons lime dust and road rock with less than 1/5 cent per ton necessary for repairs."

So says, Lourde T. Renner of Sterling, Illinois who finds lime dust production mighty profitable with his Universal "Stream-Flo" crushing, screening and loading plant. During the past 24 months this plant produced 275,000 tons of lime dust and road rock with less than \$500 necessary for repairs. Average daily production is 200 tons per hour. 21,000 tons of lime dust and 1000 tons of road rock have been produced in a single month.

The Renner plant uses a Universal 546-P portable primary crushing unit with a 36"x8' apron feeder and a 20x36 roller bearing jaw crusher. Material flows by conveyor to a 2-deck gyrating screen

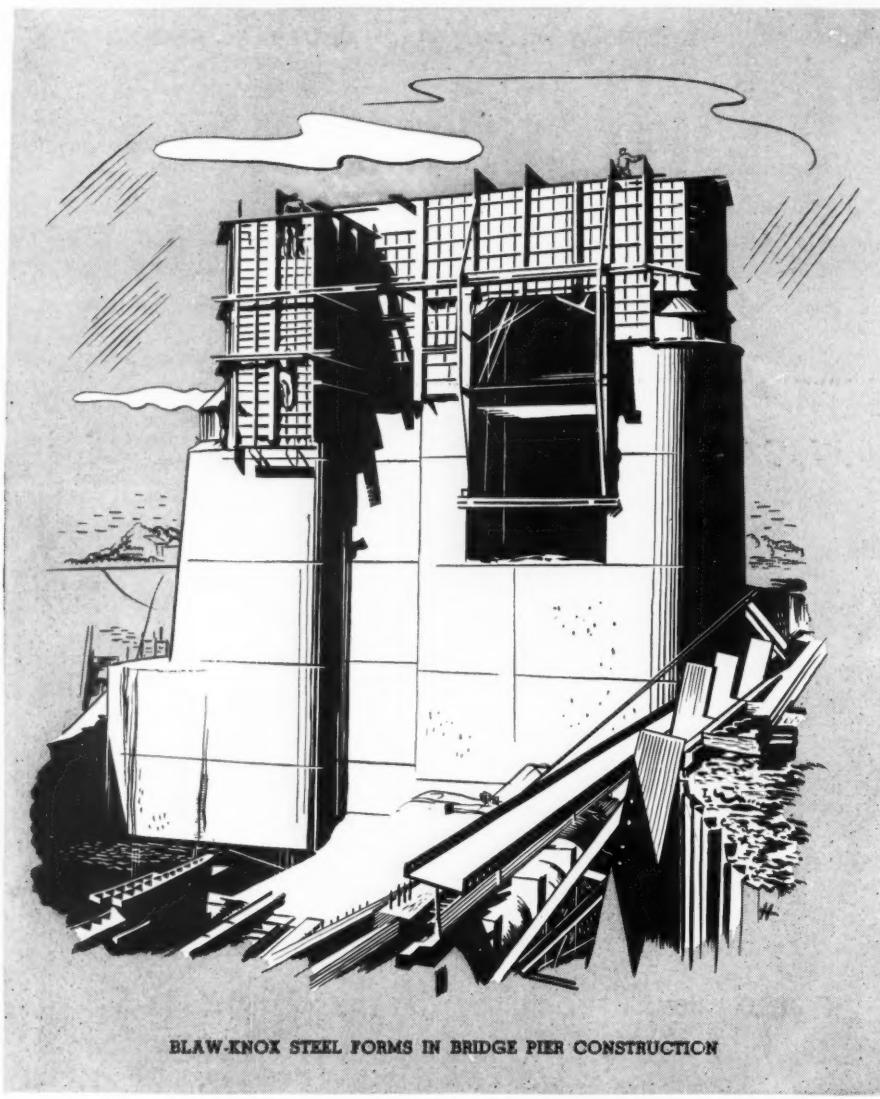
mounted over a 3-compartment steel bin. Oversize is mechanically fed to a No. 5 Universal pulverizer and returns to screen via conveyors. Plant set-up is primarily for lime dust production but a simple adjustment gives both lime dust and road rock without changing screens. Finished material is loaded from bin or stock pile.

There's profit in lime dust production. Let Universal show you how to produce "aglime" at a cost that leaves more profit. Write for illustrated literature and the facts.

**MORE TONS PER HOUR - - - LESS COST PER TON**

**ROCK, GRAVEL AND LIME CRUSHING  
PLANTS • CONVEYORS • APRON FEEDERS  
SCREENING AND WASHING PLANTS**

**UNIVERSAL**  
ENGINEERING CORPORATION  
327 Eighth Street N.W., Cedar Rapids, Iowa



## The Bigger the Job, the Bigger the Savings

Correct design, rugged construction, assured performance, versatility in meeting specific needs in job after job or in meeting minor changes in section on the same job—these are features that make savings for the contractor who uses Blaw-Knox Steel Forms for general concrete work.

Large or small, these forms mean savings. On the bigger jobs—bridges, tunnels, dams and high or long walls, the savings are bigger in proportion.

### BLAW-KNOX DIVISION OF BLAW-KNOX COMPANY

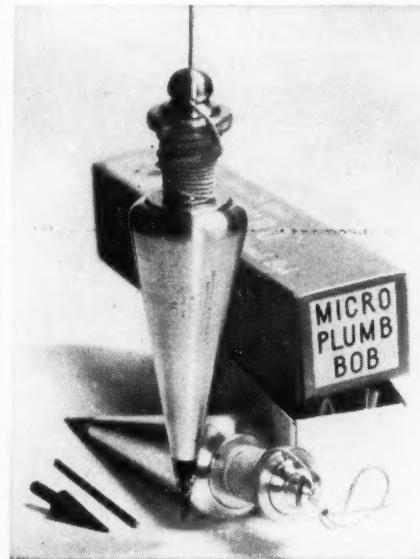
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**SEND** for Bulletin  
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design suggestions  
using Blaw-Knox  
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# BLAW-KNOX STEEL FORMS

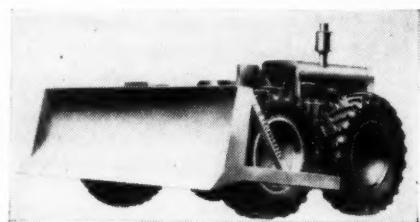
**PLUMB BOB** — Quick-acting, precise plumb bob has rotatable reel and special hook on top of neck. Cord is reeled off to approximate length wanted, then slipped into



hook which holds bob exactly centered anywhere on cord. Bob can then be minutely adjusted up and down, simply by rotating the spool.  
—Suverkrop Instruments, Box 436, Bakersfield, Calif.

### RUBBER-TIRED TOURNADOZER

—The high-speed rubber-tired Model C Tournadozer—first machine of its kind to make its appearance in the heavy equipment industry—is powered by a 160-hp. diesel engine. It has four forward speeds ranging up to 12 mph., and the same four speeds are available in reverse. It has a Tournamatic constant-mesh transmission, engineered especially to meet the requirements of heavy construction work, with



which the operator can select any gear ratio or change from forward into reverse with no shifting of gears and no loss of momentum. The Tournadozer is at its greatest advantage on work requiring much backing and maneuvering. Ability to operate over paved areas without damage further broadens job mobility and usefulness. Based on common earth excavation and 60-min. operating efficiency, it can move 184 cu. yd. an hour on a 50-ft. haul; 118 yd. on a 100-ft. haul; 66 on a 200-ft. haul; 46 on a 300-ft. haul; and 35 yd. on a 400-ft. haul.—R. G. LeTourneau, Inc., Peoria, Ill.

# BARCO MAKES A MAN A

**GIANT**

The Barco Portable Hammer has never been more in demand by owners and operators alike. This hard-hitting, tireless machine gives a worker super-strength . . . multiplies individual work capacity. Eleven special tool attachments enable Barco to handle a wide range of jobs. It's a time-saver . . . a job speeder.

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Specific tasks call for specific types of wire rope . . . but, regardless of construction, it must be tough and dependable.

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Back of the durability and dependable performance of Wickwire Rope lies 126 years of specialization in the manufacture of wire and wire products. Every step—from ore to finished product—is handled in our own plants. Only the sound heart of the steel ingot is used for Wickwire Rope and every wire is drawn until it is accurate within a fraction of a thousandth of an inch.

Wickwire Rope is available in all sizes and constructions, both regular lay and WISS-COLAY Preformed.

## THIS FREE BOOK SHOWS HOW TO MAKE WIRE ROPE LAST LONGER

"Know Your Ropes" contains 82 pages of suggestions on proper selection, application and usage of wire rope. This easy-to-read, profusely illustrated manual can save you money. For your free copy write Wire Rope Sales Office, Wickwire Spencer Steel, Palmer, Massachusetts.

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A PRODUCT OF WICKWIRE SPENCER STEEL DIVISION  
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WIRE ROPE SALES OFFICE AND PLANT—Palmer, Mass.

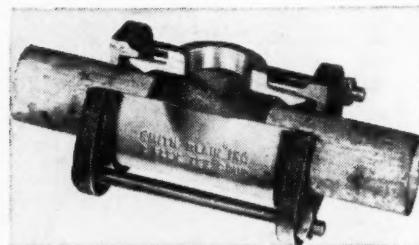
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PACIFIC COAST—The California Wire Cloth Corp., Oakland 6, Cal.



**TEE COUPLING** — Flexible tee coupling connects laterals to existing pipelines without need for field threading in trench and does away with flexible couplings, nipples, tees and unions. Flexible tee is available



for 2-in. cast iron, standard and O.D. pipe and for other sizes to as small as  $\frac{1}{2}$  in. In each, outlet is same nominal size as pipe run but has standard threads which permit use of bushing where needed.—Smith-Blair Co., South San Francisco, Calif.

**TIRE AND FIRE UNIT**—New device comes complete with hose attachment for inflating tires. It contains 10 ounces of carbon dioxide under pressure—enough to put out oil or gas fire or inflate three average size tires. Exhausted cylinders can be exchanged for loaded ones.—Ford Motor Co., Dearborn, Mich.

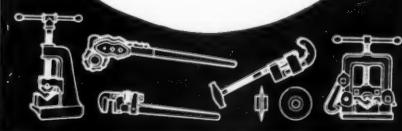


Stronger for size, because handles are drop forged with heavy forged-in lugs to take up side strain. Handier, because there is no cumbersome nut housing, because they are finely balanced tools. See and "feel" this better pipe wrench with its 10 improved features before you buy. Write for Pipe Wrench circular and name of your local "ARMSTRONG BROS." distributor.

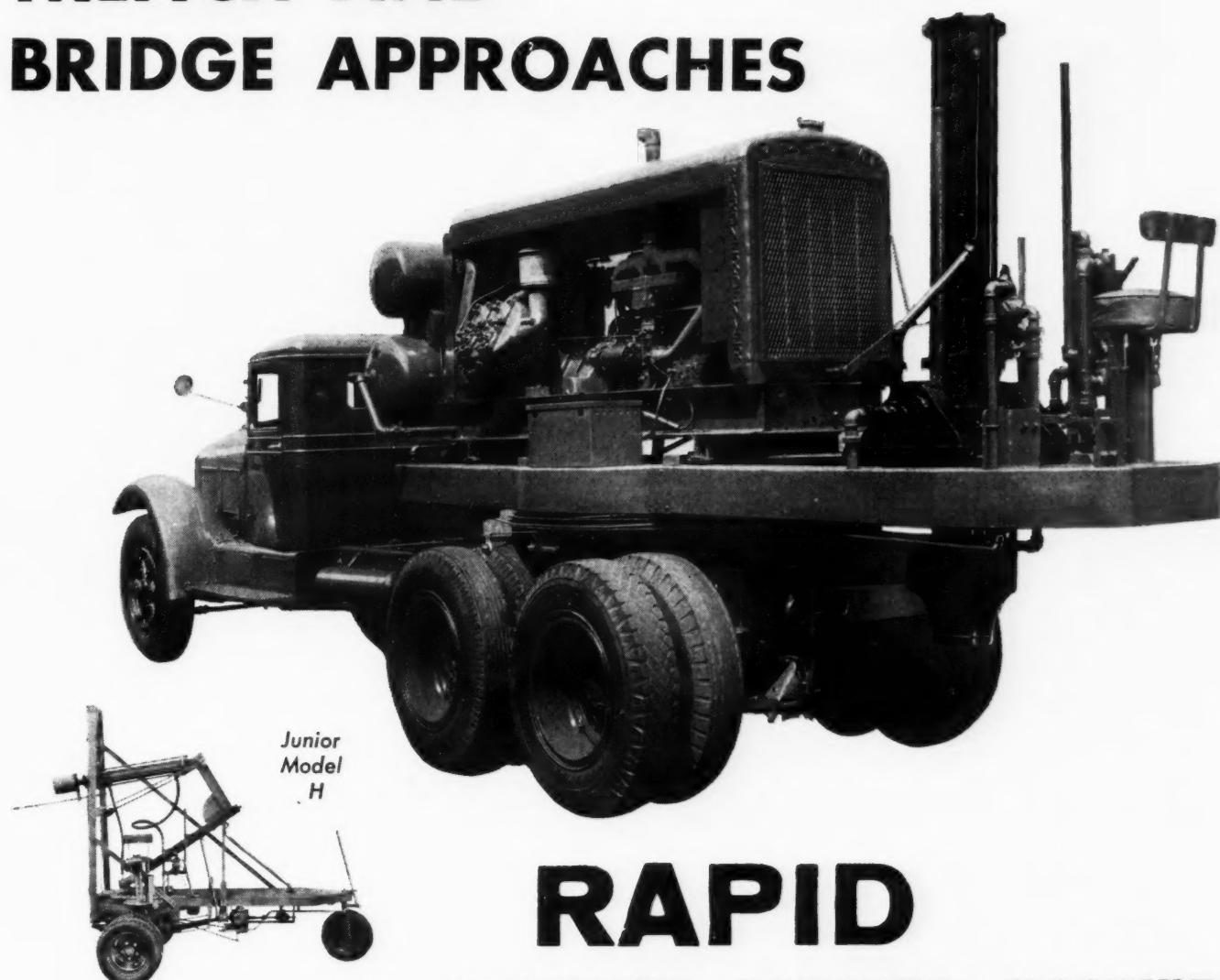
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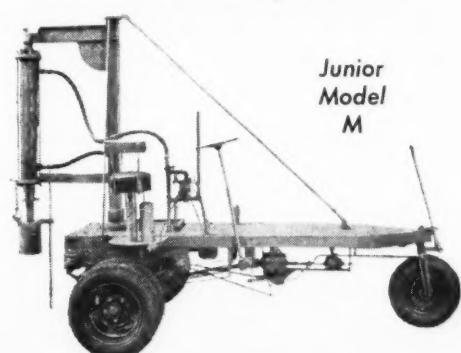
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## RAPID PAVEMENT BREAKER MACHINES

- Model-H can be converted to vertical machine in 30 minutes.
- Junior Model T for mounting on truck with compressor also available.
- Write for details and prices.

- Unequaled performance in concrete breaking.
- Fastest pneumatic method.
- Not a drop weight, but a pneumatic controlled blow.
- Average working speed, 55 blows per minute.
- Saves labor-time-dollars.
- Built to have a low upkeep cost.
- Breaks to any size desired.
- Adapted to inside or outside work.
- Increases your compressor output.
- Ideal for cutting trench and tamping backfill.
- The profitable addition to your line of equipment.
- Heavy-duty machine equipped with air motor which pivots the unit on the truck bed.
- Junior Trailer Models are equipped with air motor that propels machine and swings the boom.

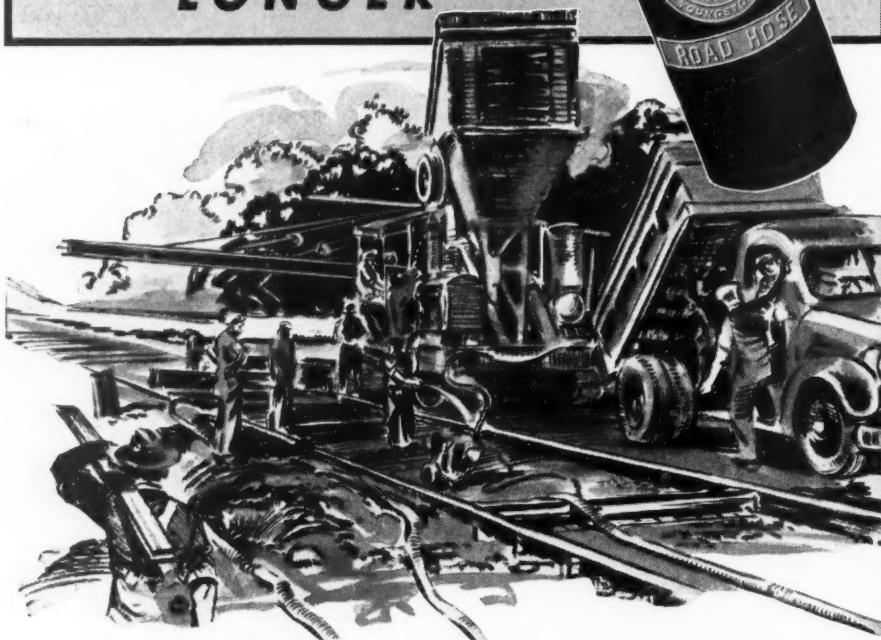


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 WATER HOSE  
 stays on the job  
**LONGER**



*Water Hose* encounters all sorts of abuse on construction projects... so often that crushing, scraping and dragging cannot be termed accidental. No accident either is the way that Republic Water Hose resists abuse, without damage or impairment of long service life. Republic Contractors Road Hose, Chariot, Tonka and other popular Republic brands are designed and built to do just that—come back for more, one tough project after another. You get these qualities in Water Hose from your nearby Republic Distributor.

**MORE SERVICE FROM RUBBER FOR INDUSTRY**

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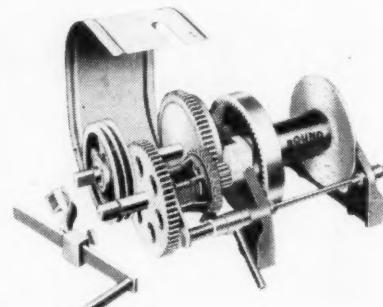
DIVISION  
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REPUBLIC INDUSTRIAL PRODUCTS  
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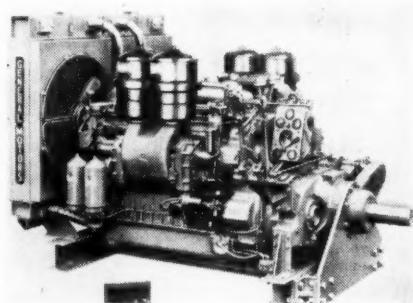
LEE DELUXE TIRES AND TUBES  
 CONSHOHOCKEN, PA.

**POWER WINCH**—New 5-ton power winch, known as Round No. 102 is fitted with V-belt pulley and connected to 2-hp, reversible type motor. It is equipped with automatic friction disk-type brake, similar to



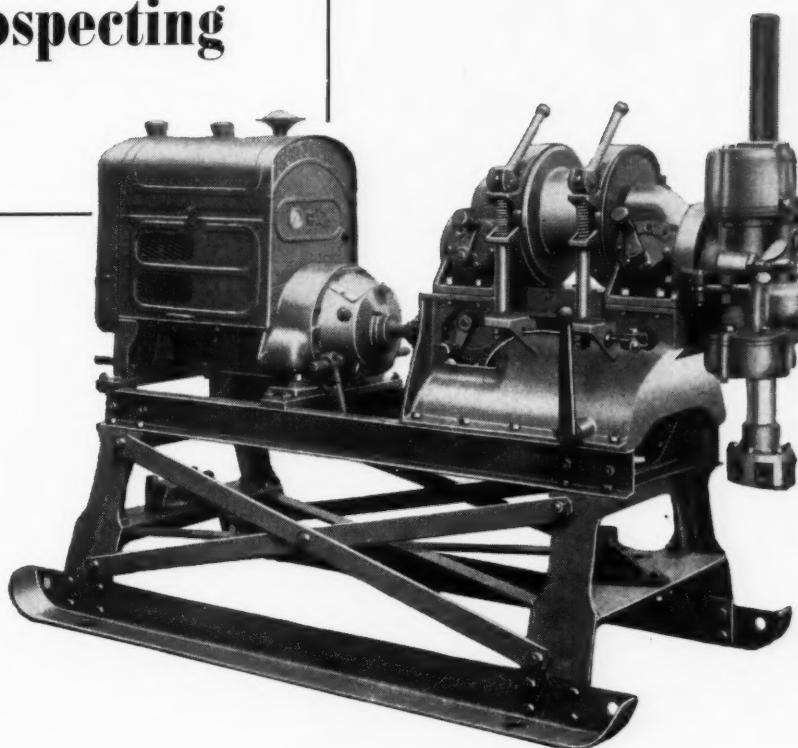
that commonly employed in electric hoist construction. This provides necessary safety and control for lowering and suspension of load. Pawl may be lifted from ratchet by means of counter-weighted lever releasing friction brake and permitting cable to be run out as rapidly as desired. Crank is supplied with winch for use in case of power failure.—David Round & Son, Cleveland, Ohio.

**DIESEL ENGINES**—New and improved General Motors Series 71 "Twin 6" diesel engine models incorporate engineering improvements. Each Twin unit is made up of two basic GM 6-cylinder 2-cycle engines mounted side by side and geared to a single shaft. Units are offered with either right or left-hand rotation. Continuous BHP at 1,800 rpm. is 276 with maximum intermittent rating of 400 at 2,000



rpm. An outstanding feature is the variety of power take-off arrangements that are being made available. Any one of four different transfer gear types can be selected. Engine units can be obtained with either radiator or heat exchanger cooling systems. Specially designed flanges can be furnished for those installations employing remotely located radiators or cooling towers. Engine base has been provided with stronger "I" beam supports, so arranged as to facilitate removal of one or both of the engines.—Detroit Diesel Engine Division, General Motors Corp., Detroit 23, Mich.

## for Test Borings and Mineral Prospecting



## CP Gasoline-Driven Diamond Core Drill

Specifically designed for drilling and standpiping jobs where the "going is tough," the ruggedly built CP No. 8 gasoline driven DIAMOND CORE DRILL has a capacity of 900 feet with E-EX Fittings.

It meets every requirement for making test borings, for mineral prospecting from the surface, and for shallow oil structure drilling in all formations.

Skid-mounted, on a substantial steel frame, the drill is readily moved from hole to hole under its own power.

When drilling at the continuous high speeds made possible by bortz bits, it gives maximum performance with low maintenance.

*Write for complete specifications.*

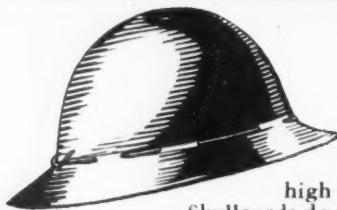


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## USE THESE AIDS TO BETTER WORKING SAFETY IN CONSTRUCTION



### M-S-A SKULLGARDS

Light weight, cool and comfortable to wear, these standard work hats of the construction industry are high-pressure molded of laminated bakelite—tough, resistant to fracture, and with high dielectric strength. Self-ventilated for coolness, skullgards do not soften or deteriorate from exposure to weather, perspiration, oil or grease. Bulletin DK-13.

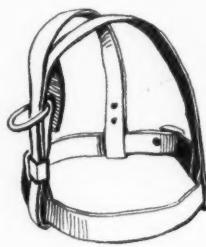


### M-S-A EYE PROTECTION

The full range of M.S.A. Protective Goggles guard eyes against job hazards. Spectacle-type goggles, chipper's goggles, welders' goggles and other types are sturdy, easy to wear and provide assured eye protection. Bulletin CE-29A.

### M-S-A SAFETY BELTS

Light, flexible and strong; furnished in shoulder-strap type which permits easy raising and lowering of workmen in confined places and through small openings—body pad type for workers on scaffolds, roofs, mountain-sides, etc., and special steel worker's safety belt. Made of high-tensile cotton webbing, with high quality hardware tested to 5,000 lbs. Write for details.



### M-S-A FIRST AID KITS



Sturdy steel All-Weather cases are equipped with molded gasket excluding dust, dirt and moisture—available in 10, 16, 24 and 36-unit sizes, each containing a complete assortment of unit-packaged first aid materials ready for instant use. Cases are equipped with brackets for wall or vehicle mounting. Descriptive details on request.

### M-S-A Clear-Vue DUSTFOE RESPIRATOR

Approved respiratory protection on dusty jobs—light in weight, easy to breathe through, comfortable to wear. Formable aluminum facepiece with molded face cushion assures snug fit; transparent plastic filter container shows filter condition at all times; filters are inexpensive, easily replaced. Bulletin CM-7.

### M-S-A CHEMOX\* OXYGEN BREATHING APPARATUS

Provides oxygen for breathing protection in highly gaseous or oxygen-deficient atmospheres—employing a replaceable chemical canister which generates oxygen as the wearer breathes, for a minimum period of 45 minutes. No high pressure valves or fittings; weighs only 13½ lbs. complete. Bulletin BM-8.

\*Trade Mark Registered

### M-S-A EXPLOSIMETER

Accurately measures combustible gas hazards at the working place, with easy one-hand operation. Portable and sturdy, any workman can use it without special training. Large, legible dial; uses standard flashlight batteries. Bulletin DN-7.

### M-S-A CARBON MONOXIDE INDICATOR

Precisely indicates low, dangerous carbon monoxide concentrations in air of tunnels, tanks, and other confined spaces, safeguarding lives and health of workers. Direct reading meter has scale range from 0 to .15% carbon monoxide in air. Bulletin DS-3.

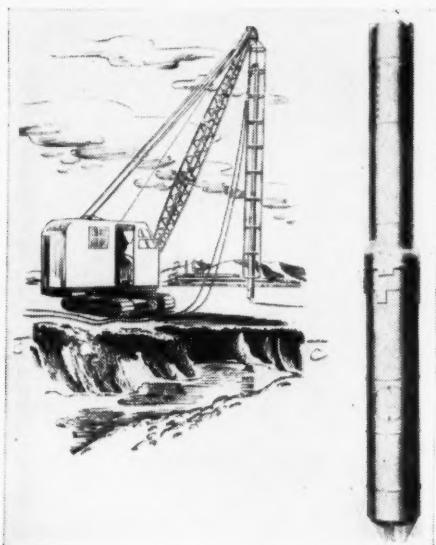
WRITE FOR FREE BULLETINS AND DEMONSTRATIONS ON ABOVE ITEMS

## MINE SAFETY APPLIANCES COMPANY

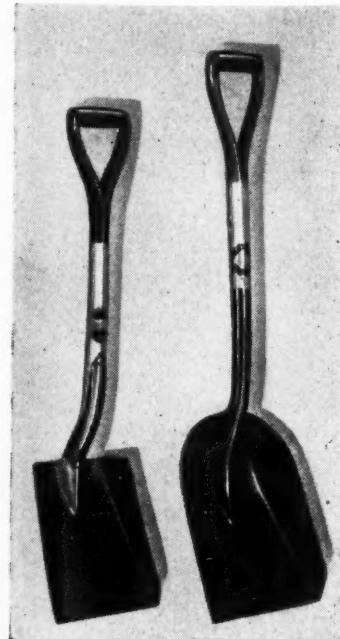
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MONTREAL • VANCOUVER • CALGARY • WINNIPEG • NEW GLASGOW, N.S.

**ELECTRIC VIBRATOR COMPACTION METHOD**—A new method of compacting sandy soil to increase its load-bearing capacity uses a vertical cylindrical vibrator powered by a motor especially designed by the General Electric Co., Schenectady, N. Y., to operate within the vibrator while it is submerged in wet sand. The huge machine, han-



dled by a crane, compacts the soil by the combined action of a jet of water and high-speed vibration induced by the motor. Called vibro-  
(Continued on page 142)



### BLADE EDGES GUARANTEED SPLIT-PROOF

## INGERSOLL SHOVELS

"The Borg-Warner Line"

Write for Catalog and Prices  
INGERSOLL STEEL DIVISION  
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New Castle, Indiana  
Plants: New Castle, Ind.; Chicago, Ill.; Kalamazoo, Mich.

**So closely machined  
and honed that you  
never need to  
replace a piston  
(due to wear)**

**... just another  
good reason why  
you save money**

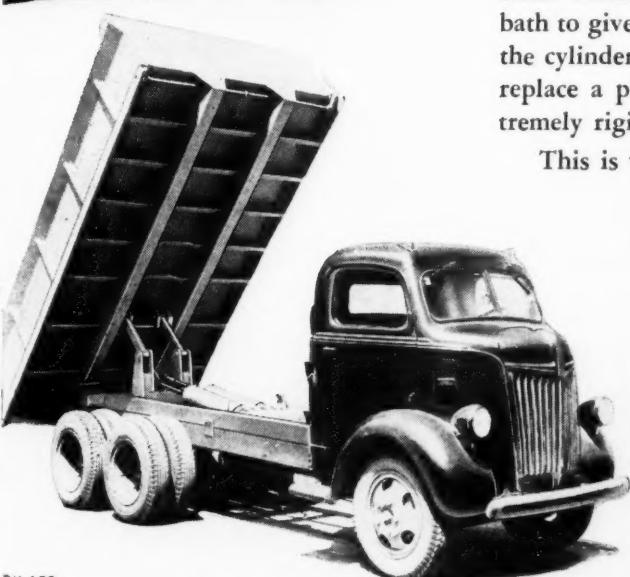
**with reliable  
Heil Hydraulic Dump Units**

Lifting 24 tons to a 50° dumping angle in 10 to 15 seconds is real performance — and that's just what you get from Heil Hydraulic Dump Units. This means faster dumping, more trips, lower costs. But there are other savings — savings that result from unusual reliability.

You see, the hoist cylinders of Heil Dump Units are made of special steel. Machined to extremely close limits, they are then honed under an oil bath to give them a mirror-like finish. The tolerance between the piston and the cylinder is so small, and the surfaces so smooth, that you never need to replace a piston due to wear. Moreover, every cylinder must pass an extremely rigid test before it leaves the shop.

This is why Heil Hydraulic Dump Units are practically trouble-free — why they keep on giving you the fast, powerful dumping action that saves money month after month after month. See your nearest Heil distributor for other important details.

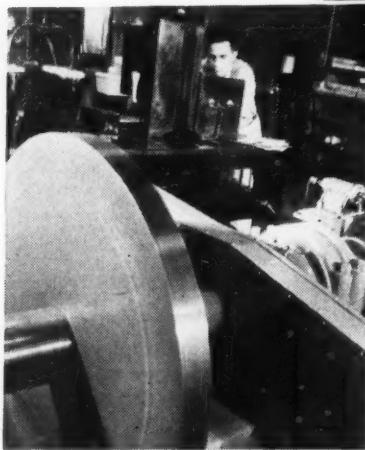
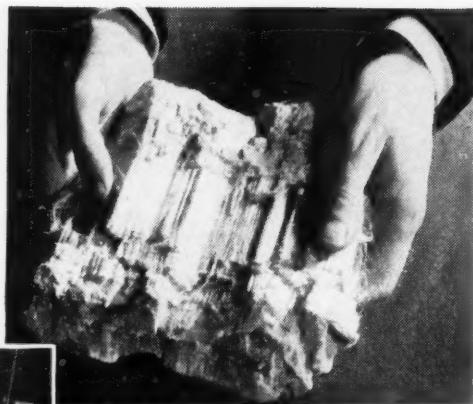
**THE HEIL CO.**  
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BH-123

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**Johns-Manville**  
**INDUSTRIAL FRICTION MATERIALS**  
No. 1 With Leading Manufacturers



(Continued from page 140)

flotation, this method diminishes the volume, and permeability of soils, lessens the active soil pressure, and increases the passive soil resistance. The entire process, including pumping the water, raising and lowering the machine, and driving the vibrator motor, is accomplished electrically.

**PLASTIC COMPOSITION FLOORING**—Plastic composition flooring for use in residential construction, "Oaktree," will furnish a new source of supply for flooring. Its ingredients include sawdust, asbestos, binding chemicals which result in high strength and resilience, and color. The material is to be mixed with water on the site and then trowled on like cement to a minimum thickness of  $\frac{1}{8}$  in. The result is a monolithic flooring which can be sanded to a smooth finish and then varnished or shellacked. The flooring can be applied either on subflooring or on concrete, or, in the case of a conversion, can be applied over old flooring. It can be scored to resemble tile or random-width oak flooring. The finish flooring has a color similar to that of medium oak flooring.—Kompolite Co., Brooklyn, N. Y.

National  
**Carbide**  
**FLOODLIGHTS**

FOR ALL PURPOSES FOR WHICH FLOOD-LIGHTS ARE REQUIRED

Simple in construction  
Economical in Cost  
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Available in 1500,  
8,000 and 16,000 candlepower units.

National Carbide N-200 Light illustrated. Write for literature showing entire line of Floodlights and Lanterns.

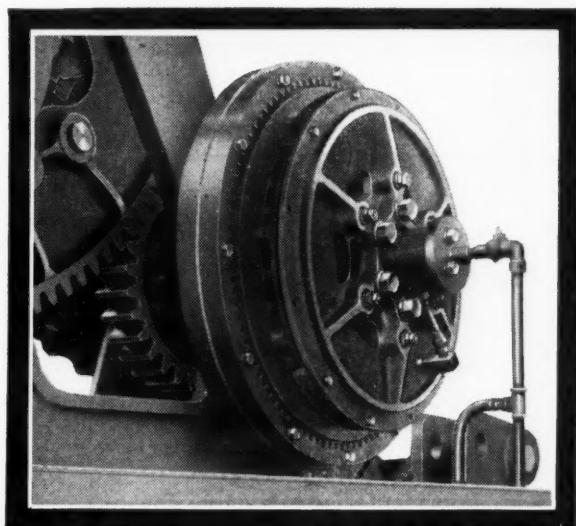
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60 East 42nd St.  
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→ A revolutionary new power shovel clutch that provides smooth, positive action in place of jerky, uncontrolled performance . . . a clutch that seldom requires adjustment . . . a clutch with only one working part, and without a single cam, lever, bolt, piston or valve.

→ It's a power shovel clutch with direct air power that assures positive control, without any "grabbing" effect . . . a clutch that needs no mechanical attention . . . a clutch whose simple operation automatically compensates for any wear on the clutch linings.

## THE OSGOOD AIR-CUSHION CLUTCH



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POWER SHOVELS • CRANES • DRAGLINES • CLAMSHELLS • BACKHOES • PILE DRIVERS

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DIESEL, GASOLINE OR ELECTRIC POWERED •  $\frac{3}{8}$  TO  $2\frac{1}{2}$  CU. YD. • CRAWLERS & MOBILCRANES

# DUFF-NORTON JACKS SPEED UP WORK

ON EVERY  
CONSTRUCTION JOB

Contractors and construction engineers find Duff-Norton's complete line of Jacks ideal for building or repairing bridges, constructing or wrecking buildings, rigging and all heavy lifting, lowering, pushing or pulling of steel girders, plate, machinery, etc. required on construction jobs.

**WRITE for Catalog 203A,**  
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jacks that help speed  
up construction jobs.

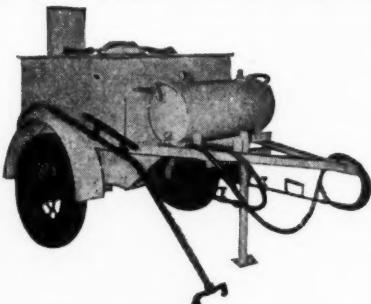
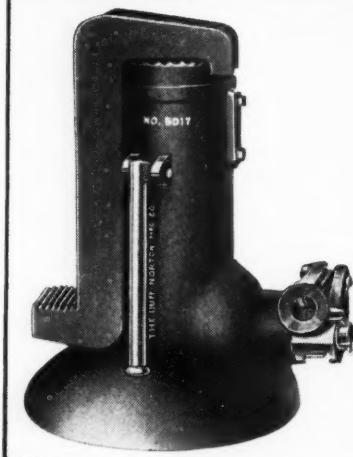


**THE DUFF-NORTON** MANUFACTURING CO.  
PITTSBURGH 30, PA.  
See Your Associated Equipment Distributor.



**BRAZING ROD FOR SHEET ALUMINUM**—Rod makes smooth, clean joints and is particularly good for use on very thin sections of aluminum. It melts at temperature well below melting point of sheet aluminum and less preheat and less flux is required than for rods that have been previously available. It produces corrosion-resistant welds with good matching color and tensile strength of 30,000 psi.—All-State Welding Alloys Co., Inc., 96 West Post Road, White Plains, N. Y.

**NEW PLYWOOD PANEL**—This product, named "Welchboard" after its discoverer, is plywood with a smooth, relatively hard, durable surface which will take a fine finish for either inside or outside construction and will withstand repeated wettings, long-time soakings or even boiling. In the construction field, the product will be useful in the fabrication of interior and exterior walls of homes as the panels can be cut and fastened with ordinary carpentry tools. They are easily sawed, can be nailed or screw-fastened, and the body being plywood, they can be glued to framing members when desired.—Douglas Fir Plywood Association, Tacoma 2, Wash.



## HEATING KETTLES FOR ASPHALT AND TAR

Fire Proof — Oil Burning  
Hand and Motor Driven Spray

Other Products

### CONCRETE VIBRATORS

Gasoline Engine and  
Electric Motor Driven Models

### FRONT END SHOVELS

For Industrial Tractors

### AGGREGATE DRYERS

for Stone and Sand

### ASPHALT PLANTS

Portable — Stationary

Write for Circulars

**White Mfg. Co.**

ELKHART

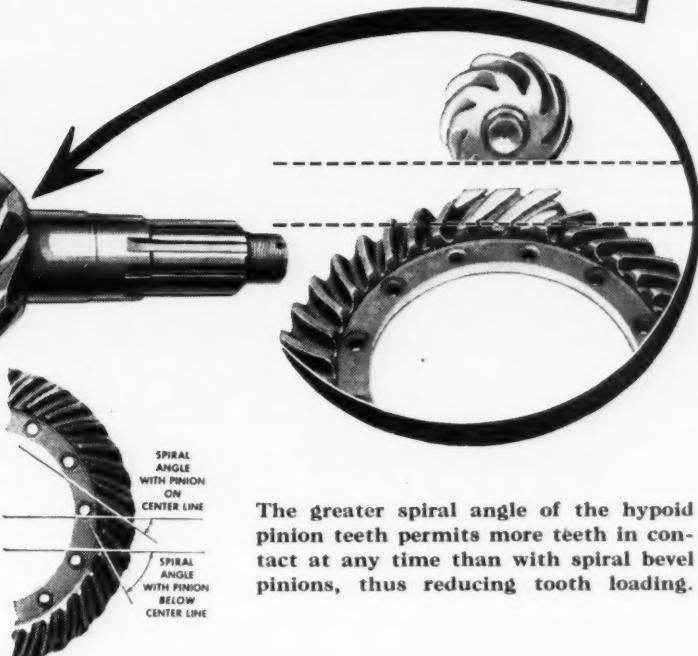
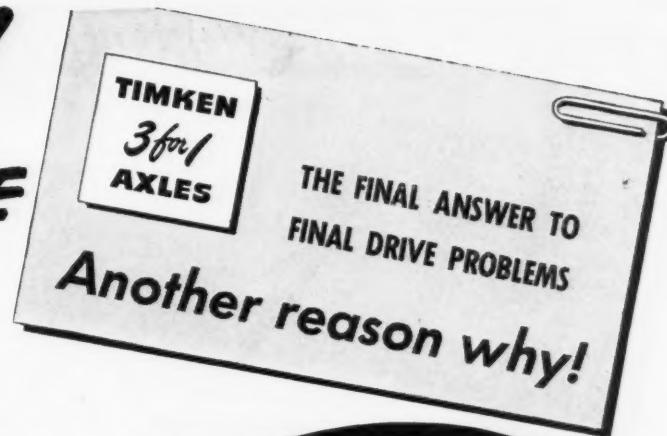
INDIANA

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West

# HYPOID! FOR HY-PERFORMANCE



Hypoid gear and pinion used in Timken single-reduction final drive.



The greater spiral angle of the hypoid pinion teeth permits more teeth in contact at any time than with spiral bevel pinions, thus reducing tooth loading.

Hy-Performance Hypoid Gearing is here! . . . in new Timken "3 for 1" Axles!

Not in just one or two axles, but in a *complete new line!*—in a *complete range of capacities!*—and in *all three types of final drives*: Single-reduction, double-reduction, and two-speed double-reduction.

Here's how hypoid is basically different—basically better:

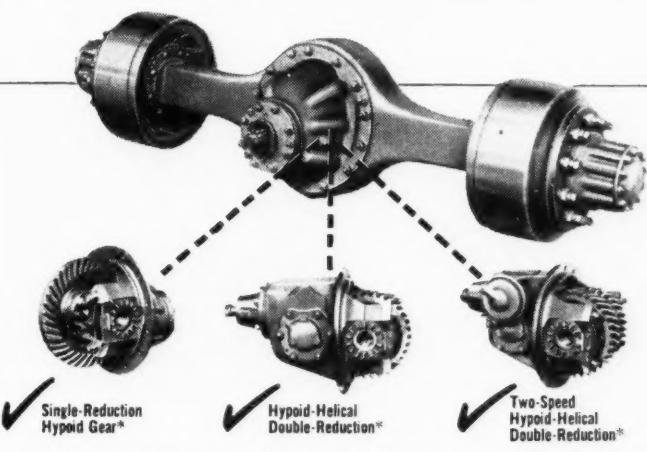
The offset location of the hypoid pinion, combined with the greater spiral angle of the pinion teeth, results in a pinion and shaft that are larger in diameter and therefore stronger. The greater

spiral angle of the hypoid pinion teeth permits more teeth in contact, thus reducing tooth loading.

The larger diameter of the hypoid pinion makes practical higher numerical gear ratios, which are difficult or impractical to obtain with spiral bevel pinions because their diameter becomes too small.

Now, every truck from medium to heavy-duty capacity can have the proved economy, durability and dependability of Timken Hypoid "Hy-Performance" gearing.

Look under the new trucks you buy! Specify Timken "3 for 1" Axles.



✓ Single-Reduction  
Hypoid Gear\*

✓ Hypoid-Helical  
Double-Reduction\*

✓ Two-Speed  
Hypoid-Helical  
Double-Reduction\*

\*INTERCHANGEABLE IN SAME AXLE HOUSING USING THE SAME AXLE SHAFTS

# TIMKEN *3 for 1* AXLES

THE TIMKEN-DETROIT AXLE COMPANY

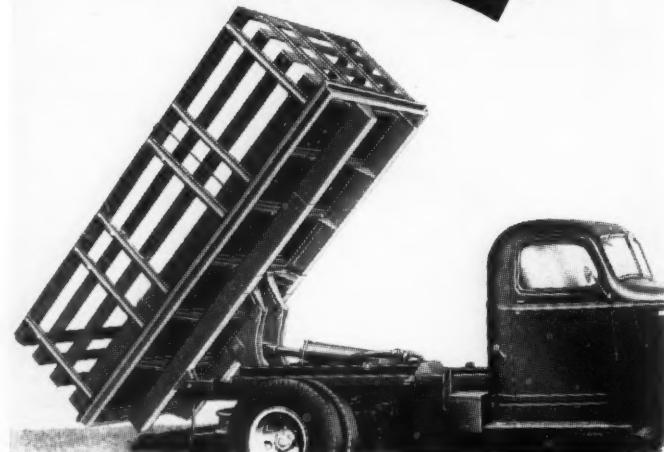
DETROIT 32, MICHIGAN

WISCONSIN AXLE DIVISION, OSHKOSH, WISCONSIN  
TIMKEN AXLE BRAKE DIVISION, DETROIT, MICHIGAN

**USED THE WORLD OVER**



**EXCELLENT  
IS THE  
WORD FOR  
PERFECTION  
BODY and HOIST  
REPUTATION**



*Write for name of nearest Perfection Distributor*

**THE PERFECTION STEEL BODY COMPANY  
GALION, OHIO**

**PERFECTION**  
STAKE and DUMP BODIES  
HYDRAULIC HOISTS



**FOR ANY TRUCK**  
STANDARD or SPECIAL UNITS  
IN ALL SIZES · FOR ANY USE

## **New PUBLICATIONS From MANUFACTURERS**

The catalogs and bulletins reviewed below will keep you posted on latest developments in construction equipment and materials available for your use

### **INDUSTRIAL WHEEL TRACTORS**

—(24-p., 2-color catalog) Lists many applications for which industrial tractors are used and illustrates some of matched equipment available with them.—International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.

**GENERATORS** — (4 - p. pamphlet) Describes latest models of generators and four-circuit automatic equipment for charging motive power batteries used in electric trucks and in locomotives used for underground hauling.—Motor Generator Corp. Division of The Hobart Brothers Co., Hobart Square, Troy, Ohio.

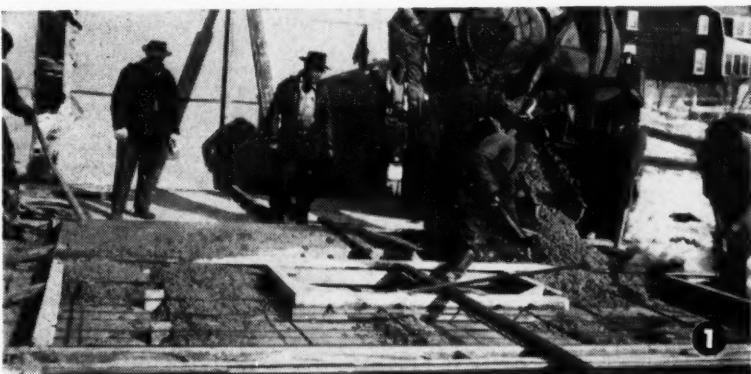
**STEEL SHEETS** — (12 - p. bulletin) Describes use of Ferro-Therm in construction of refrigerated structures of all types. Tests by government official agencies and leading authorities are cited.—American Flange & Manufacturing Co., Inc., 30 Rockefeller Plaza, New York, N. Y.

**AIR FILTERS** — (23-p. booklet) Discusses various types of industrial dust problems and typical applications of air filters. Included are chart of size and characteristics of air-borne solids and sections dealing with atmospheric dust and filtered air.—American Air Filter Co., 215 Central Ave., Louisville 8, Ky.

**PACKAGE SUBSTATIONS** — (78-p. publication) Describes new package substations for utility and industrial power distribution. It presents data on full line of complete and coordinated package substations rated from 750 to 45,000 kva., with information on procedure for selecting standard arrangements to conform to existing requirements. Along with photographs of each substation is one-line diagram of system. Also listed are components, ratings, and dimensions. Thirty illustrated arrangements are provided as guides for selecting suitable unit. Five-step ordering guide is outlined.—General Electric Co., Schenectady, N. Y.

# TIKT-UP CONSTRUCTION

WHERE LEHIGH EARLY STRENGTH CEMENT



1



2



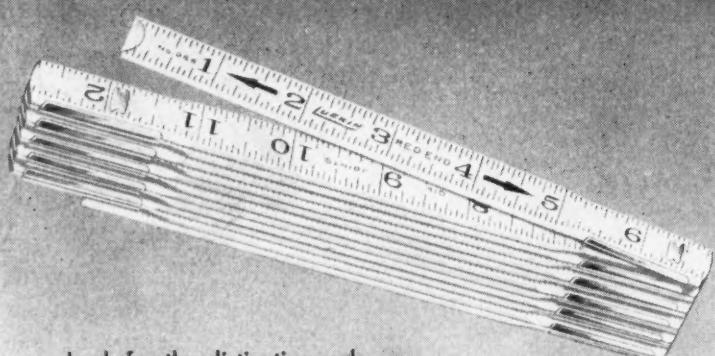
3

**Lehigh**  
CEMENTS

LEHIGH EARLY STRENGTH CEMENT • LEHIGH NORMAL CEMENT  
LEHIGH MORTAR CEMENT • LEHIGH AIR-ENTRAINING CEMENT

LEHIGH PORTLAND CEMENT COMPANY • ALLENTEWON, PA. • CHICAGO, ILL. • SPOKANE, WASH.

# LUFKIN 66 "RED END" RULES



Look for the distinctive red ends when buying a folding wood rule—the finest rule of its type. Prominent markings. Brass lock joints, caps, strike plates—rust-proof throughout! Buy Lufkin "Red End" from your dealer. For free catalog write THE LUFKIN RULE CO., SAGINAW, MICHIGAN, New York City.

**LUFKIN**

FOR DURABILITY

**SAVE** with **STERLING'S TUBULAR FRAME**



In Sterling's All-Steel Wheelbarrow with Tubular Frame, you get the most barrow for your money. Cost-saving features include: steel tray with lapped corners — All welded construction, no rivets — Steel reinforcing rod around top edge — V front braces and cross supports — All parts securely anchored to the sturdy one-piece steel tube. Truly a barrow that withstands hard usage over a long period of time. Be sure to specify **STERLING** on your next barrow order. Delivery will be as prompt as conditions permit.

STERLING WHEELBARROW CO., Milwaukee 14, Wis.

**Sterling**  
WHEELBARROWS

Look for this Mark of  
STERLING Quality

**GLASS, PAINT AND METAL**—(New edition, data sheet handbook) Answers all questions concerning products of issuing company, as well as of Pittsburgh Corning Corp. It is made up of handy pocket-sized loose leaf folder containing individual sections indexed for ready reference.—**Pittsburgh Plate Glass Co., 632 Duquesne Way, Pittsburgh 22, Pa.**

**RADIO FREQUENCY HEATING**—(8-p. technical bulletin) Covers principles, advantages, equipment and types of this method of gluing wood. Recommended glue mixtures are listed.—**Casein Co. of America, Division of Borden Co., 350 Madison Ave., New York 17, N. Y.**

**CONCRETE HAULING**—(8-p. bulletin) Describes Dumpcrete and its advantages in hauling air-entrained concrete. Specifications are given for Models 2C and 4C.—**Maxon Construction Co., Inc., Dayton 2, Ohio.**

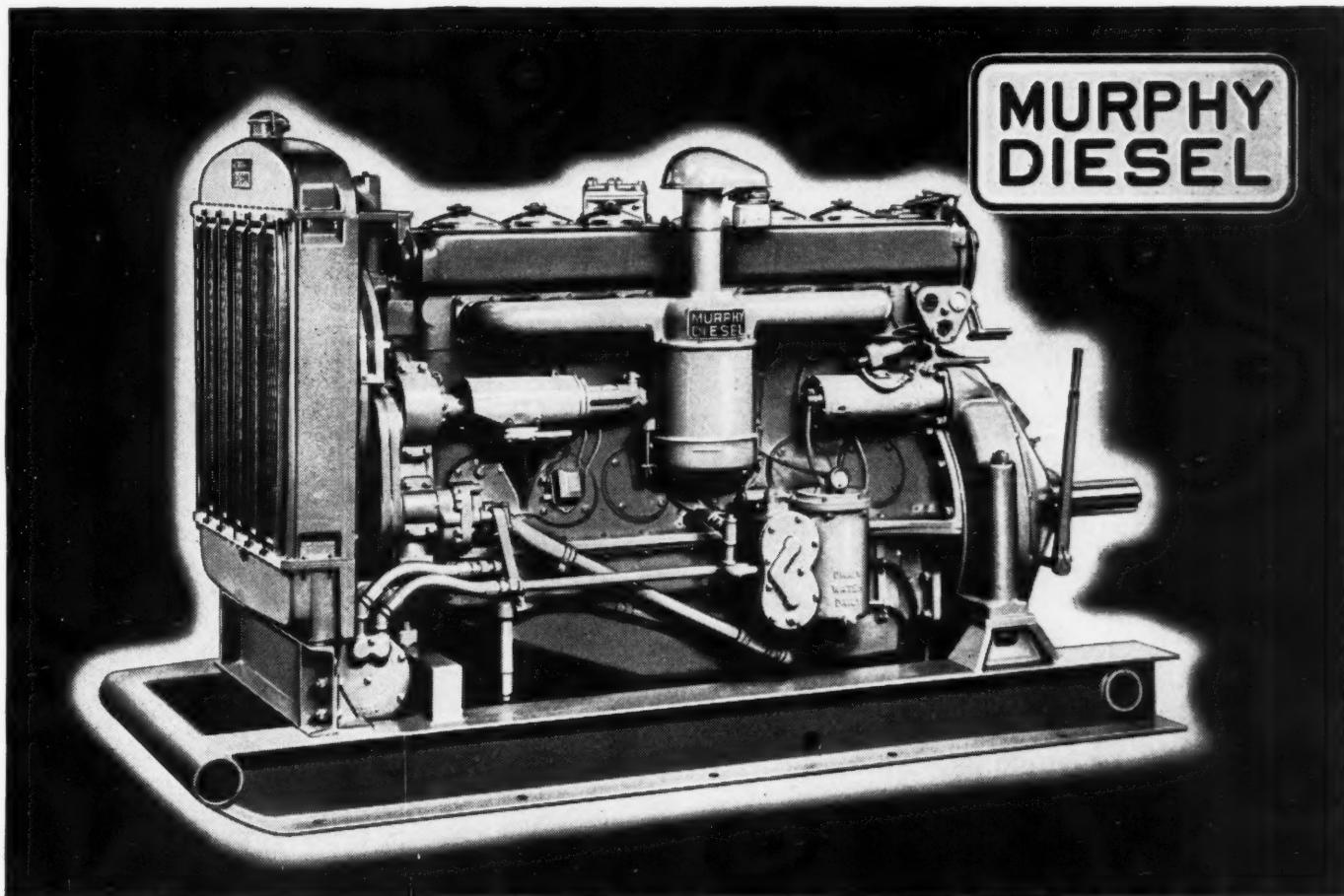
**MOTOR PATROL**—(8-p. bulletin) Describes, illustrates and gives specifications for new, improved model Trojan utility speed patrol, which can be equipped with scarifier, bulldozer and snow plow.—**Contractors Machinery Co., Inc., Batavia, N. Y.**

**CRUSHERS**—(Two bulletins) Describe Series SL jaw crushers and Series SGRB star gear roll crushers, giving complete specifications, capacity ratings, and dimensions, together with cutaway and detail illustrations.—**Universal Engineering Corp., Cedar Rapids, Iowa.**

**RUBBER**—(28 - p. booklet) Reproduces 26 case history advertisements that stress part played by research and development in solving problems for rubber and Koroseal customers.—**B. F. Goodrich Co., Akron, Ohio.**

**PROFIT INSURANCE**—(12-p. booklet) Is devoted mainly to captioned action photographs taken on typical Tournapull jobs in general construction, industrial, railroad, mining, pit and quarry, and export fields.—**R. G. LeTourneau, Inc., Peoria, Ill.**

**POWDER METALLURGY**—(48-p. catalog) Gives information on both powdered metal parts and powdered metal bearings.—**Keystone Carbon Co., St. Marys, Pa.**



Powered by a dependable MURPHY DIESEL Model ME-46, 6 x 6½", 4-cyl., 115 hp intermittent, 100 hp continuous, this Telsmith Crusher is owned by Fischer Construction Co., Farmington, Minn.

## Powered for More Output

POWERED by MURPHY DIESEL means "powered for more output." Rugged and dependable, economical to operate and maintain, easy to start in any weather, MURPHY DIESELS have proved they are built to "take the load" and deliver more output with all types of heavy-duty construction equipment. When you buy new equipment or repower old machines, be



sure to be powered for more output and more profit, by specifying MURPHY DIESELS.

**MURPHY DIESEL COMPANY**  
5339 W. Burnham St., Milwaukee 14, Wisconsin

DIESEL ENGINES: 90 HP TO 215 HP



GENERATOR SETS: 60 KW TO 115 KW

*Dependable Heavy-Duty Power*

# Our Best Friend and Yours, Too

The Distributor of  
Industrial Supplies

In wartime, and in the equally acute situation of the present, he has fulfilled our appeal "to keep the freight cars moving swiftly."

His warehouse is the short cut to quick delivery of our essential tools and parts. He saves time, money and costly delays.



**ADVANCE  
CAR MOVER COMPANY**  
APPLETON • WIS.  
CANADIAN FACTORY—CANADIAN ADVANCE CAR MOVER CO.  
WELLAND, ONTARIO CANADA

All Leading Distributors  
Stock the *Badger* Line

CAR MOVERS: Badger...  
Power King . . . New Badger  
PARTS: Spurs . . . Handles  
(Straight-grained Hardwood)  
For All Makes

## Owen SELLS "IN-BUILT" PERFORMANCE

### Distinctive Digging Features . . .

Deep penetration by bucket teeth—Balance maintained during digging—Undiminished closing power—Shells closed with maximum leverage—Adjustable closing speed—Easy complete discharge.

### Durability . . . . . with Long Life

Rigid shell construction—High carbon alloy steel teeth—Dropping shocks absorbed by Owen patented stops—Sealed grit-proof center shaft bearings—Protected cables and sheaves—Lever type arm bracket exerts maximum leverage in forcing shells into the material.



**THE OWEN BUCKET CO.**  
6020 Breakwater Ave., Cleveland, O.

BRANCHES: NEW YORK, PHILADELPHIA,  
CHICAGO, BERKELEY, CALIF.



A MOUTHFUL  
AT EVERY BITE



**PIPE COUPLINGS**—(106-p. catalog) Contains full description of every Dresser product. Novel feature, "Visual Index," illustrates 36 principal pipe joining and repair products, together with brief descriptions of their uses and page numbers on which details can be found.—**Dresser Manufacturing Division, Dresser Industries, Inc., Bradford, Pa.**

**HYDRAULIC JACKS**—(12-p. catalog) Describes hand jacks up to 100-ton capacity, gage jacks and wheeled floor jacks.—**Blackhawk Mfg. Co., Milwaukee 1, Wis.**

**POWER UNIT**—(4-p. folder) Describes new Aldrich-Lytte hydro-pneumatic power unit. This simplex, double-acting hydraulic pump is engineered to provide low-volume high-pressure service.—**Aldrich Pump Co., Allentown, Pa.**

**TRUCKS**—(Ten bulletins) Give sales engineering data and important points of comparison of company's trucks.—**Motor Truck Division, International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.**

**CELLAR STAIR UNIT**—(4-p. folder) Describes stair units, fabricated of special grade of steel, which include side walls for cellar-way as well as risers and treads.—**Bilco Co., 164 Hallock Ave., New Haven, Conn.**

**MAGNETIC CRANE CONTROLS**—(20-p. booklet) Describes five types of controls for handling any type of load. Descriptive information, wiring diagrams, performance curves and application guide to aid in selecting type of a-c control best suited to any application are included.—**Westinghouse Electric Corp., P. O. Box 868, Pittsburgh 30, Pa.**

**BULK STORAGE TANK PRE-HEATER**—(One-page bulletin) Describes new method of heating oil or other heavy-bodied substances in bulk storage tank before they enter suction line.—**Rempe Co., 340 N. Sacramento Blvd., Chicago 16, Ill.**

**FIRE PREVENTION**—(4-p. folder) Illustrates principal steps to take in case of fire, and pictorially describes various types of fire extinguishers in plants and how they should be used.—**The B. F. Goodrich Co., Akron, Ohio.**

# Pier holes in the making . . .



better — faster  
at lower cost  
with BUDA

## Earth Drills



The accompanying views present a graphic demonstration of a typical large foundation pier hole job put down fast, at lower cost, with a BUDA Earth Drill. This job required scores of foundation supports for a sizeable group of prefabricated Veterans houses, part of which are shown above.

Digging in varied soil conditions, often handicapped by adverse weather conditions, the Earth Drill's flexibility, speed and dependability paid off by providing accurate, clean-cut pier holes, ready for pouring in a matter of minutes.

BUDA Earth Drills have almost unlimited hole work applications...for drilling holes up to 42" in diameter to a depth of 15 feet, or for small holes up to 100 feet in depth. Your nearest BUDA distributor will be glad to furnish complete details on the complete range of Earth Drill sizes and models.

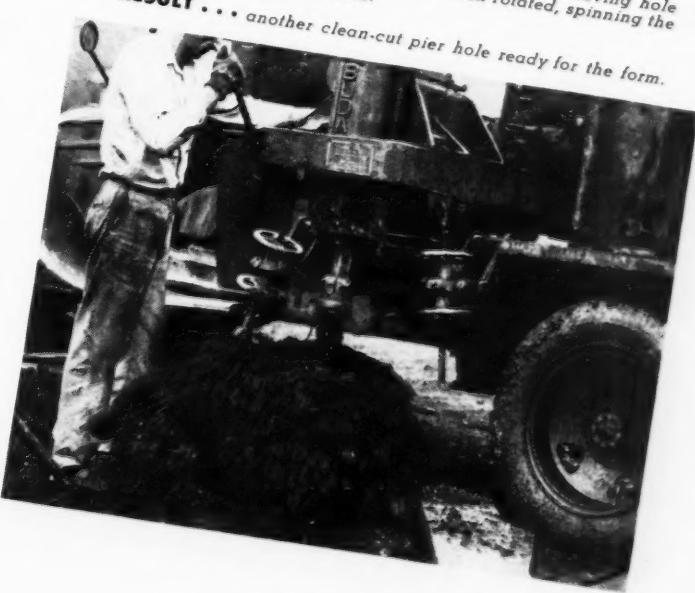
# BUDA

15430 Commercial Avenue  
HARVEY (Chicago Suburb) ILLINOIS

DOWN GOES THE DRILL . . . backed by plenty of power  
from its own BUDA gasoline engine . . . fast, easy to operate.

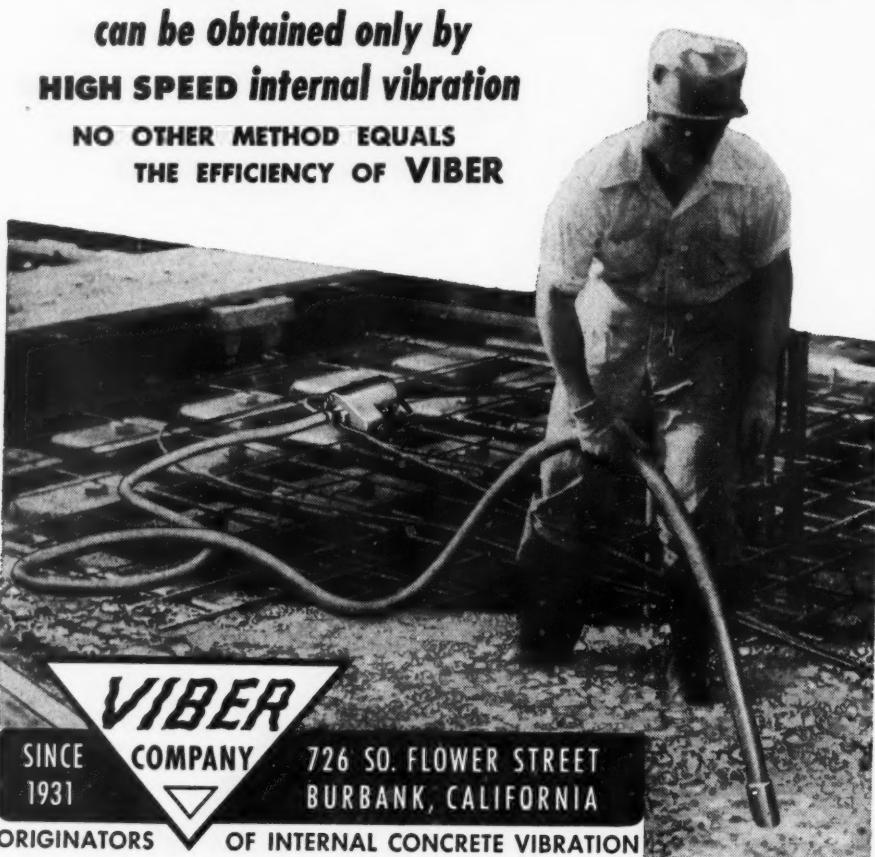
UP COMES THE HELIX . . . loaded with dirt, leaving hole  
edges clean and straight . . . helix is then rotated, spinning the  
dirt free, away from the hole.

RESULT . . . another clean-cut pier hole ready for the form.



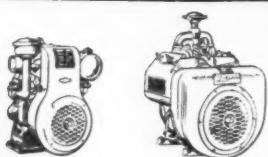
# Complete compaction

*can be obtained only by  
HIGH SPEED internal vibration  
NO OTHER METHOD EQUALS  
THE EFFICIENCY OF VIBER*



**VIBER**  
SINCE 1931 COMPANY 726 SO. FLOWER STREET  
BURBANK, CALIFORNIA  
ORIGINATORS OF INTERNAL CONCRETE VIBRATION

**POWER CERTAINTY**  
PROVIDED BY  
**WISCONSIN**  
HEAVY-DUTY  
*Air-Cooled*  
**ENGINE**



The Kwik-Mix 11-S Dandie, made by Kwik-Mix Company, Port Washington, Wis. (Koehring Subsidiary), not only has a reputation for fast charging, fast discharge and quick re-mixing . . . but it is also noted for Power Certainty . . . the ability to keep on going day after day, in any weather, anywhere. This is a logical result of heavy-duty power delivery by the Model VE-4 (V type, 4 cylinder) Wisconsin Air-Cooled Power Unit

which turns up 20.5 hp. at 2200 R.P.M. Incorporated in this engine are features of Heavy-duty design pioneered by Wisconsin . . . assuring maximum serviceability on the job and minimum maintenance costs. For Power Certainty . . . regardless of the kind of equipment you are using . . . specify "Wisconsin Air-Cooled Engines" . . . for any machine or job within a 2 to 30 hp. range. Descriptive literature on request.



**WISCONSIN MOTOR Corporation**  
MILWAUKEE 14, WISCONSIN  
World's Largest Builders of Heavy Duty Air-Cooled Engines

## EQUIPMENT MEN

*and Their Companies*

Edgar F. Schaefer, executive vice-president of Gardner-Denver Co., was elected company president and H. G. Myers, former president, became chairman of the executive board at the annual stockholders' meeting held March 28 at Quincy, Ill.

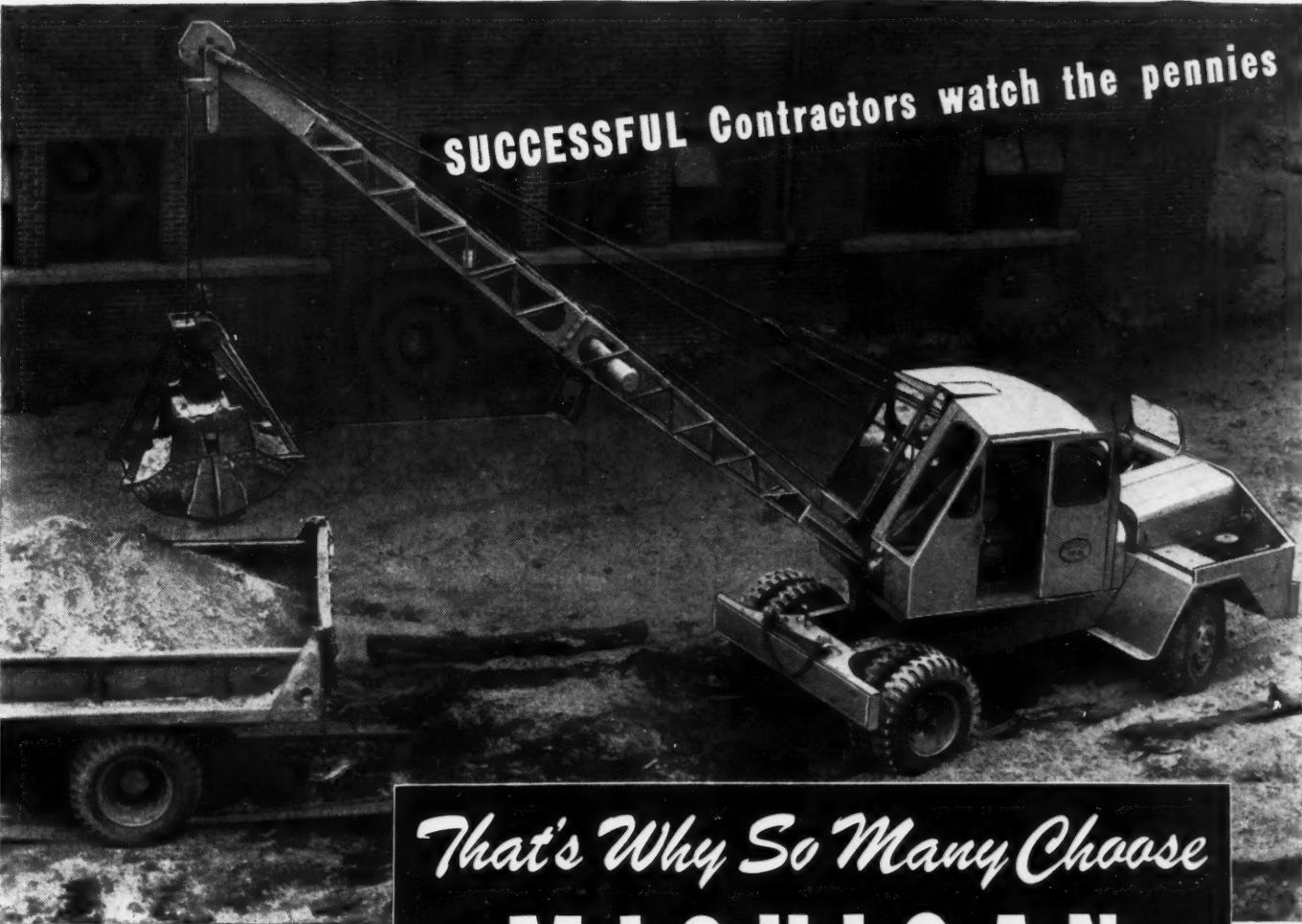


Fruehauf Trailer Co., Detroit, Mich., announces the appointment of R. B. Hollingsworth as regional manager of the Southeast area, with headquarters in Atlanta, Ga. He succeeds E. E. Springer, who is named manager of Fruehauf's new Florida branch, under construction at Jacksonville. Dozier L. Hood is promoted to branch manager. With the acquisition of the Carter Manufacturing Co. and its branches in Memphis, Nashville and Birmingham, N. A. Carter, Jr., is appointed Fruehauf-Carter regional manager covering the mid-South area.

The appointment of two new divisional managers of the parts department of Caterpillar Tractor Co., Peoria, Ill., and nomination of their assistants has been announced. C. D. Byrns has been named manager of the Eastern division and Eldon L. Mason manager, Western division. B. J. Grimm has been appointed assistant manager of the Eastern division and E. W. Ryder, transferred to the Western division.

Announcement is made by the Link-Belt Speeder Corp., of the transfer of the general sales, credit and accounting departments from Chicago to 1201 Sixth St., S.W., Cedar Rapids, Ia. Communications and telephone calls pertaining to repair parts for the series "300" and "500" machines only will continue to be handled at the Chicago office.

Frederick H. Vogel, wood technologist of wide experience, has joined the laboratory staff of the Timber Engineering Co., Washington, D. C.



*That's Why So Many Choose*  
**MICHIGAN**  
**THE PIONEER AIR-CONTROLLED**  
**TRUCK-TYPE SHOVEL-CRANE**

**Noted for**  
**OPERATING ECONOMY**  
•  
**SPEED ON THE ROAD**  
**AND ON THE JOB**  
•  
**DEPENDABILITY**  
**AND VERSATILITY**

With contractors who keep a sharp eye on costs, MICHIGAN ranks "tops." They know that they can depend on MICHIGAN to deliver top-notch performance, day after day. They know that with MICHIGAN they can "come out on top" even on those small, scattered jobs that cannot be handled profitably with ordinary equipment... Get all the facts about MICHIGAN Mobile SHOVELS-CRANES—send for Bulletin CM-57.

**FINGER TIP AIR CONTROLS • 6 to 12 TON CRANES**  
• • • • **3/8 YD and 1/2 YD SHOVELS • • • •**  
**FULLY CONVERTIBLE TO ALL STANDARD ATTACHMENTS**

**mICHIGAN**  
POWER SHOVEL COMPANY  
BENTON HARBOR MICHIGAN

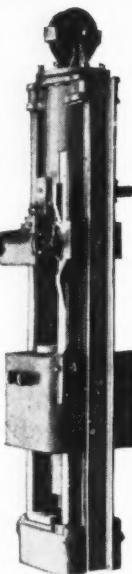


## WARRINGTON-VULCAN Single-Acting Steam PILE HAMMERS

This rugged pile driver doesn't monkey with the tough ones. It socks 'em and sinks 'em with scientific power that saves strain on the pile and the pile hammer.

The rapid, regular, continuous action of the Single-Acting Warrington-Vulcan is readily adapted to driving all types of piles—wood, steel or concrete. It operates at medium steam pressure and delivers a moderate frequency of low velocity blows from a relatively heavy ram. Money-saving performance, sturdy construction and simple design exposing all working parts for easy accessibility have made this pile driver a favorite on the tough jobs since 1887.

Full details, without obligation. Write today.



**Robert L. Miller** has been appointed district sales manager for all Heil products in the central states of Iowa, Missouri, Nebraska, Kansas, and Colorado, with headquarters at Kansas City.

**B. M. Kaiser** has become Southwest district manager of motor trucks for International Harvester Co. **J. T. Sullivan**, formerly Southwest district manager, has been transferred to the Eastern district in the same capacity.

**Independent Pneumatic Tool Co.**, Chicago, manufacturers of Thor portable pneumatic and electric tools, announces the opening of a technical office at Sao Paulo, Brazil. **Reuben P. Rudy** is manager of the new office.

**Kaiser Steel Co.**, Oakland, Calif., reports the promotion of **Richard L. Erlin** from general sales service manager to the position of manager of rolled steel products sales. He is being succeeded as general sales service manager by **O. D. Hole, Jr.**

**James H. Morris** has been appointed president of the John W. Patterson Co., Pittsburgh, Pa.

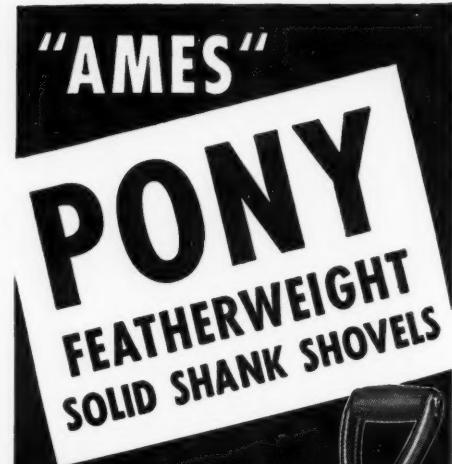
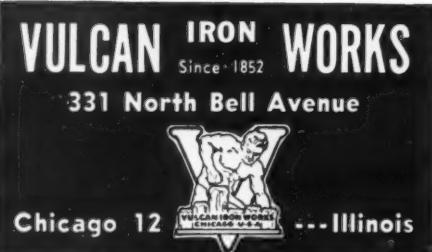


The ultimate in pneumatic placing of concrete! Simpler . . . faster . . . more economical! Model 200 illustrated uses separate compressor—has 4-speed transmission. Other models smaller and larger. Write for new bulletin.

### CONSTRUCTION MACHINERY COMPANIES

WATERLOO, IOWA

Makers of Mixers . . . Batching and Placing Equipment . . . Carts . . . Hoists . . . Pumps . . . Power Saws . . . Electric Generators . . . Guns!



*Perfect  
Balance*

*Equipped  
with  
SHOCK  
BAND*

MADE  
FROM ONE  
SOLID BAR  
OF STEEL

AMES  
Since  
1774

- 1 — Blade is forged from solid bar of steel.
- 2 — "AMES" shock band protects and strengthens handle.
- 3 — High bend for perfect balance.
- 4 — Engineered to insure user completely satisfactory results.

*Ask Your Jobber*

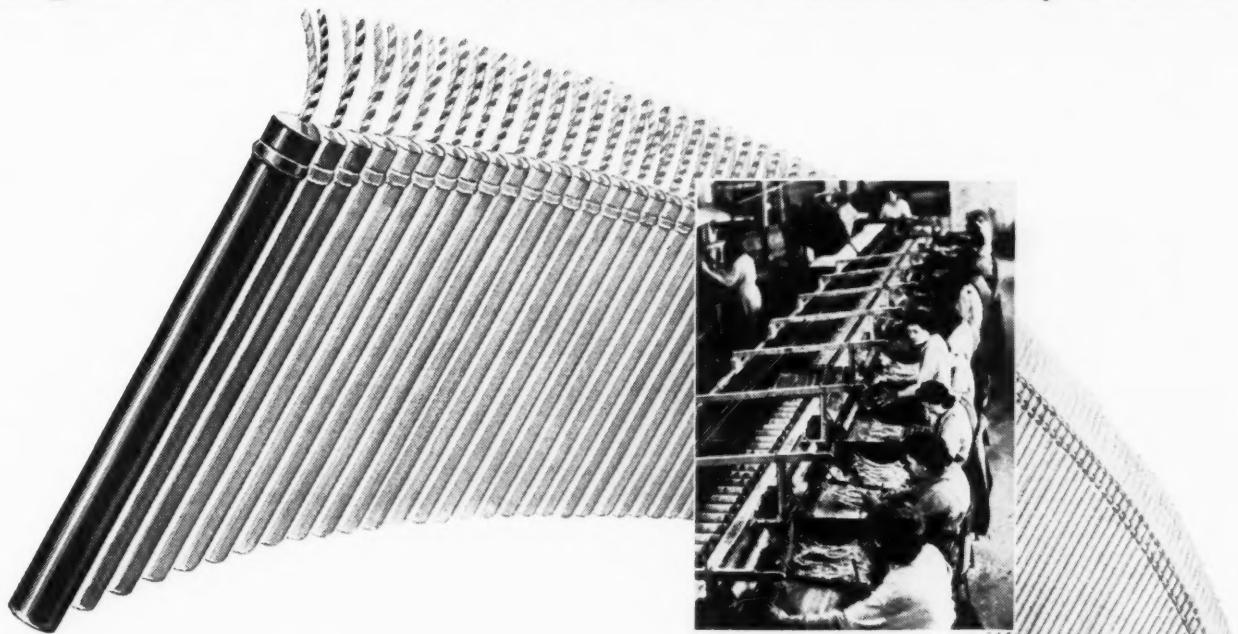
### AMES PRODUCTS

SHOVELS	FORKS
SPADES	HOES
SCOOOPS	RAKES
POST HOLE DIGGERS	AGRICULTURAL HANDLES

AMES BALDWIN WYOMING CO.  
Parkersburg, W. Va. North Easton, Mass.

# NO EXPLOSIVES ACCIDENTS *in the making of* 520,000,000 MANASITE DETONATORS

An Eight-Year Record That Means Added Safety For You



Nearly nine years ago, Atlas announced MANASITE detonators, with the new nitromannitolexplosive compound—less sensitive to shock and friction—a complete departure from ordinary detonators.

Today, we have completed nearly nine years of MANASITE detonator manufacture without a single accident of explosive origin. Over 520 million MANASITE detonators have been used.

Prior to introduction of MANASITE, occasional accidents of explosive origin did happen in our own manufacturing plant, despite most elaborate precautions.

We do not say any detonator is com-

pletely safe. We have not relaxed our plant safety precautions one iota.

But we do say and proudly believe that the MANASITE safety record reflects itself in field use—tending to minimize the accident record incident to detonators. To thousands of miners, quarrymen and construction workers interested in safety, this is a significant fact.

Even with this increased safety, MANASITE detonators are dependable in action. There is no sacrifice of detonating efficiency. And no increase in cost. Get in touch with your Atlas Representative for complete details.

*Manasite Detonators are Included in the Atlas Rockmaster Blasting System*

"ROCKMASTER"—Trade Mark; Manasite—Reg. U. S. Pat. Off.

**ATLAS** EXPLOSIVES  
"Everything for Blasting"

ATLAS POWDER COMPANY, Wilmington 99, Del. • Offices in principal cities • Cable Address—Atpowco



# SMOOTH POWER

## The NEW ONAN AIR-COOLED 10 H.P. 4 CYCLE "CK" ENGINE



A new, light, compact, easily-installed engine of wide power range. Completely "De Luxe" equipped, easy-to-get-at controls, and many other plus points. Prompt delivery on early orders.

ONAN ELECTRIC PLANTS—A.C.—350 to 35,000 watts in standard voltages and frequencies; D.C.—600 to 10,000 watts, 115 and 230 volts. Battery chargers—500 to 6,000 watts, 6, 12, 24, 32 and 115 volts. ONAN AIR-COOLED ENGINES—CK: 2-cylinder opposed, 10 h.p.; BH: 2-cylinder opposed, 5.5 h.p.; 1B: 1-cylinder, 2.5 h.p.



WRITE FOR  
SPECIFICATIONS

**D. W. ONAN & SONS INC.**  
4954 Royalston Ave. Minneapolis 5, Minn.

- **HEAVY-DUTY CONSTRUCTION:** Short, sturdy crankshaft. Extra-large bearings.
- **SMOOTH POWER:** Opposed 2-cylinder design. Fully counter-balanced crankshaft.
- **SUPER COOLING:** Axial-flow fan delivers 600 cu. ft. of cool air per minute. Larger fin area.
- **ALUMINUM CONSTRUCTION:** High-strength aluminum castings reduce weight.
- **ELECTRIC STARTING AVAILABLE:** Built-in electric push-button or automatic starting.
- **COMPACT, LIGHT WEIGHT:** Fits into 15 x 19 x 18 inch space. Weighs only 97 pounds.

## ONAN 4-Cycle ENGINES

### SAFE FOR THE BIGGEST LOADS



Hauling contractors everywhere depend on Jahn Heavy-Duty Trailers for safe, fast and economical moving of their heaviest loads like this 110,000-lb. transformer. Deep, wide flange main beams run the full length of the trailer. Cross-members and outriggers are I-Beam sections. Improved, fabricated gooseneck adds greater built-in strength. Positive, self-equalized braking at each wheel regardless of position of axle assures maximum safety. See your nearest Jahn dealer for details.

\*  
**C. R. JAHN COMPANY**  
1335 W. 37th Place Chicago 9, Ill.  
Heavy duty trailers from 5 to 100 tons.



**Construction** involving \$50,000,000 for new facilities centered on the production of new postwar products is in the engineering and planning stages and more than \$22,000,000 in construction is already under way at Monsanto Chemical Co., St. Louis, Mo.

**Appointment of Floyd Jones** as sales manager of the portable compressor division of the Davey Compressor Co., Kent, Ohio, was announced recently.

**Ladish Co.**, Cudahy, Wis., has established a new district office at 452 Spring St. N.W., Atlanta, Ga., and discontinued its New Orleans office.

**John C. Painter** has been appointed district representative of The Galion Iron Works & Mfg. Co., manufacturers of rollers and motor graders, to cover the states of North and South Carolina, Florida and Georgia.

**Appointment of Leonard W. Beck** as acting general sales manager of the Cummins Engine Co., Inc., has been announced by **R. E. Huthsteiner**, vice-president, assistant general manager and controller. Mr. Beck's new responsibilities will be the overall administration of the distribution division (sales and service). His offices will be at the factory in Columbus, Ind.

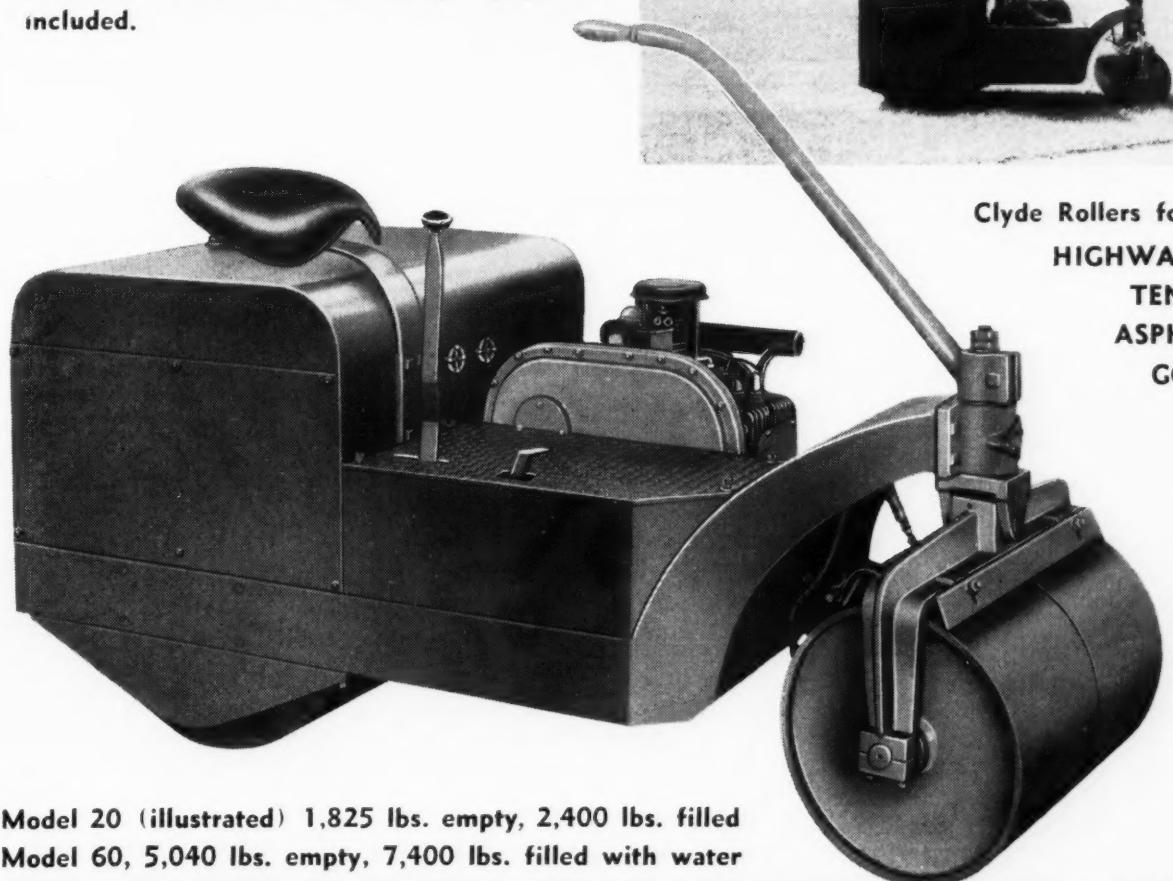
**W. W. Hurlbut** of Los Angeles, Calif., and **Miss Hazel V. Dennis** of Baltimore, Md., were the first prize winners of \$500 in the 100-percent metering contests sponsored by the Pittsburgh Equitable Meter Division of Rockwell Manufacturing Co., Pittsburgh, Pa. These contests were designed to stimulate public thinking on the community advantages of 100-percent water metering.

**Capitol Steel Corp.** of New York has moved its executive offices to 15 Park Row, New York 7, N. Y.

**The Calcium Chloride Association** has announced the moving of its offices from the Penobscot Bldg., Detroit, Mich., to the LaSalle Bldg., 1028 Connecticut Ave., N.W., Washington 60, D. C. The move has been under consideration for some time and Washington was selected because of facilities offered for engineering and technical reference in the fields in which calcium chloride is used.



Band friction clutches allow instant travel direction change smoothly and noiselessly and result in a more satisfactory back and forth ironing motion. Short wheel base permits easy maneuvering in close quarters. Rugged and simple design assures less maintenance. Plate and angle construction welded into rigid unit. Both models work close to wall, curb or building to minimize hand finishing. Water tank and spray equipment included.



Model 20 (illustrated) 1,825 lbs. empty, 2,400 lbs. filled  
Model 60, 5,040 lbs. empty, 7,400 lbs. filled with water

**TWO PRACTICAL AND  
POPULAR SIZES,  
SCIENTIFICALLY ENGINEERED  
TO GIVE BETTER  
ROLLING RESULTS**



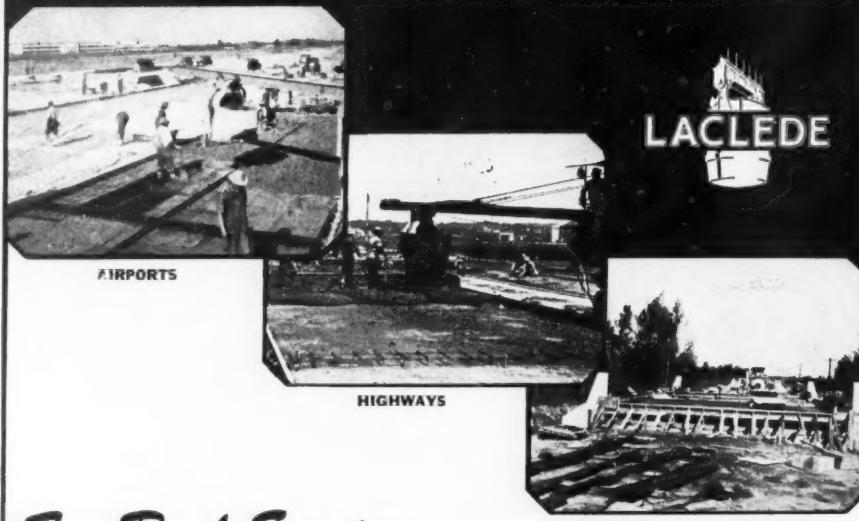
Clyde Rollers for:  
**HIGHWAY PATCHING  
TENNIS COURTS  
ASPHALT WALKS  
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LAWNS  
PARKS**



**CLYDE IRON WORKS, Inc.**

Duluth 1, Minnesota  
Subsidiary of Barium Steel Corp.

# STEEL REINFORCING



*For Real Service —*

LET LACLEDE SUPPLY YOUR REINFORCING NEEDS FOR CONSTRUCTION OF HIGHWAYS, BRIDGES, AIRPORTS, CULVERTS AND DRAINAGE STRUCTURES. DELIVERY IS MADE TO THE JOB SITE WHEN NEEDED — COMPLETELY ENGINEERED AND DETAILED — READY FOR PLACING. A FULL LINE OF REINFORCEMENT IS AT YOUR SERVICE.

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GENERAL OFFICES

ARCADE BUILDING

ST. LOUIS, MISSOURI

**10-TON**  
**CULVERT SECTIONS**

are  
"MADE TO ORDER"  
for this  
**ROGERS**  
**TRAILER**



The broad, sturdy deck of this Rogers trailer readily accommodated four huge culvert sections. This 40-ton load was swiftly and easily transported to the construction location.

Write for the catalog illustrating a complete range of sizes and types.

**ROGERS BROTHERS CORPORATION**  
220 ORCHARD ST. ALBION, PA.

# ROGERS TRAILERS

EXPERIENCE builds 'em • PERFORMANCE sells 'em

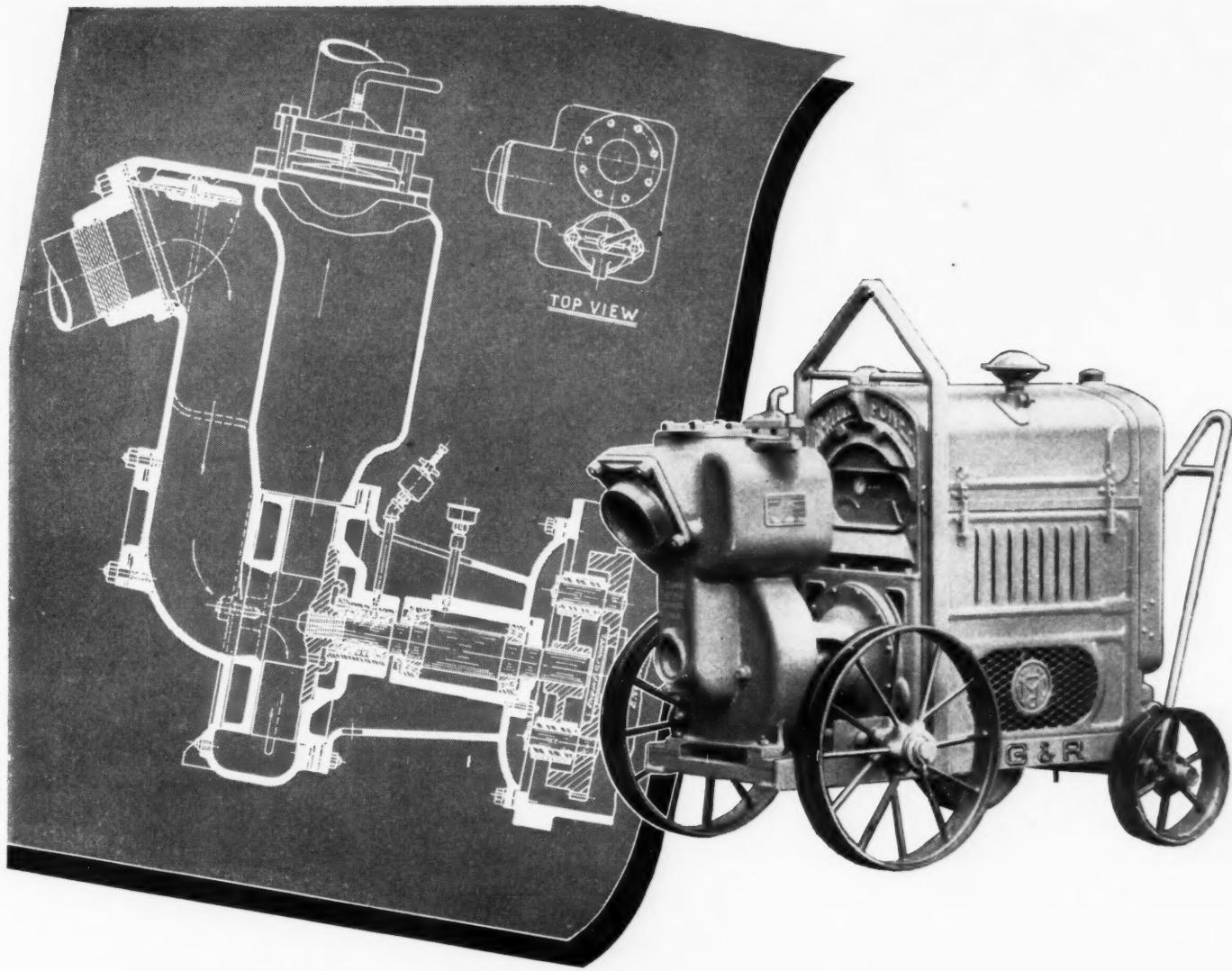
The Thornton Tamden Co., Detroit, Mich., manufacturer of special truck equipment, has discontinued that name and now is operating as Detroit Automotive Products Corp., F. D. Knoblock, president, announced. He explained that the former name was appropriate when the Thornton tandem drive was the only product manufactured by the company, but the addition of new products called for a name more accurately describing the business. He added that there has been no change in management, personal or corporate structure. Other officers and executives are A. F. Knoblock, chairman of the board; S. E. Beker, vice-president; R. F. Barnum, secretary-treasurer, and Ivan Graham, sales manager.

Link-Belt Co., Pacific division, Seattle, Wash., manufacturers of conveying and power transmission machinery, announce that they have completed and are now occupying their newly built plant at the corner of Sixth Ave. South & Hinds St. in Seattle. This modern new plant contains a machine shop, larger warehouse facilities, and an up-to-date office building. Fred A. Koepf, district manager, and Harvey V. Eastling, manager of engineering sales, direct the activities of the company in this Pacific Northwest area.

Curtis Wright Industries, manufacturers of trailer coaches, have just announced the acquisition of a 5 1/2-acre tract in Hillgrove, adjoining Puente, Calif., where the company's present main plant and offices are located. A new, modern factory and warehouse building will be constructed on the site. In addition to the new building, the size of the present plant is being doubled.

G. A. Shallberg, Jr., has returned to the Borg-Warner Corp., Chicago, as advertising manager.

The 35,000-lb. TD24 was the feature of the International Harvester Co.'s power and equipment display held recently at the Melrose Park headquarters of the Industrial Power Division. International's complete line of crawler and wheel tractors and paver units was displayed with products of 32 other manufacturers. Construction and maintenance equipment included road rollers, diesel-powered air compressors, sweepers, mowers, snow removal equipment and motor patrols of all sizes and types. Also on display were tractors equipped with dozers, shovels, land-clearing equipment, winches, cranes, pipe-laying equipment and heavy hauling wagons.



## MR. CONTRACTOR:- *The real story of pump value is found by examining the inside.*

It's the simplicity and good design that accounts for the outstanding performance of Gorman-Rupp self-priming, centrifugal pumps. They are the most efficient and trouble-free pumps you can buy and the reasons are built into the pumps: Streamlined inside where streamlining counts. Smooth surfaces, no traps -- these pumps will handle any muck or solids that will pass the intake strainer. No bypasses, no pipes, no valves -- after initial prime there is nothing to do in priming but start the motor and you start the water. This greater priming simplicity pays off in more work for less power and fuel.

Impeller operates at motor speed without reduction gears -- eliminating another source of wear, trouble and maintenance. The impeller, rotating on high grade roller bearings, is the only moving part. Every wearing part is easily replaceable. What little maintenance is necessary can be done by an unskilled man with common tools. These are a few of the reasons why Gorman-Rupp centrifugal pumps will outperform and outlive any comparable equipment. We will be glad to place one in your hands and let you be the judge. Write your distributor for information.

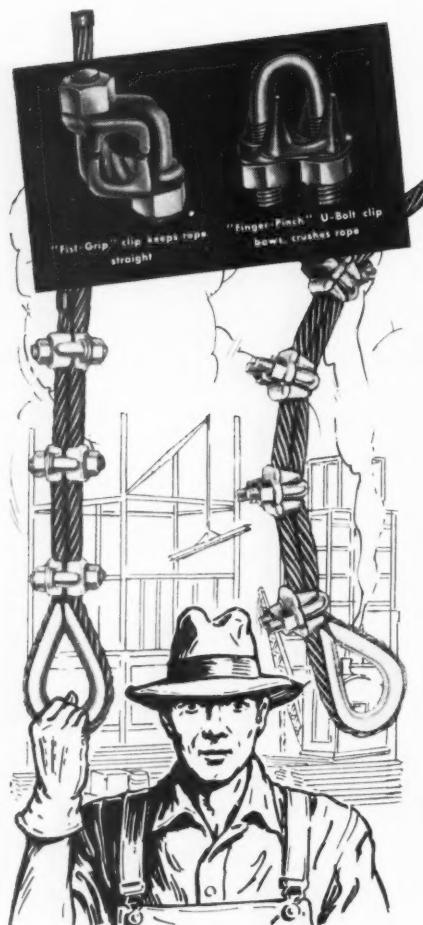
Originators in 1936 of the Famous  
Blue Pump that others now imitate.

**THE**



**GORMAN-RUPP COMPANY**

308 BOWMAN STREET • MANSFIELD, OHIO



## "I'LL TAKE MINE STRAIGHT"

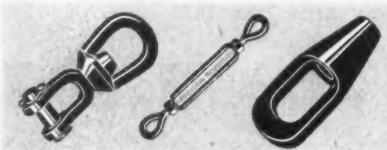
A straight rope is a stronger rope . . . and for maximum strength, rope makers insist that kinking and crushing be eliminated. U-bolt clips always deform rope . . . particularly if they're "staggered". But LAUGHLIN "FIST-GRIP" CLIPS insure a straight rope because four flat bearing surfaces deliver uniform pressure over entire contact area . . . rope stays straight — no reverse bends under load.

"FIST-GRIPS" are foolproof . . . made in identical halves — can't be "staggered" . . . nuts on opposite sides for quick, easy wrenching . . . bolts and saddles drop-forged for strength and SAFETY. Look for LAUGHLIN'S "L" trade-mark at your supply house . . . write for catalog to Dept. 1, The Thomas Laughlin Co., Portland 6, Maine.

**LAUGHLIN**



THE MOST COMPLETE LINE OF DROP-FORGED WIRE ROPE AND CHAIN FITTINGS



Pittsburgh Steel Products Co. has been revived and will be a marketing organization responsible for the sale of the parent Pittsburgh Steel Co.'s line of construction products such as Steeltex, concrete reinforcement fabric and highway guard. Top management group of the subsidiary company is the same as for the parent organization, headed by Joseph H. Carter, president. Thomas C. Phillips and Robert L. Glose have been elected vice-president in charge of sales and general manager of sales, respectively, of the subsidiary.

The J. D. Adams Manufacturing Co., Indianapolis, Ind., announces the appointment of Buel Wallis as Eastern division sales manager. All sales east of the Mississippi will come under his jurisdiction, as well as federal sales.

After 52 years in the pipe business, Edwin P. Corey has tendered his resignation as general manager of tubular sales of the Youngstown Sheet and Tube Co., Youngstown, Ohio.

The appointment of Henry Rowold as assistant general sales manager of Mack-International Motor Truck Corp. was recently announced.

## How to solve practical engineering problems in statics and dynamics

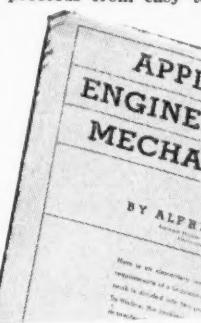
. . . made clear with hundreds  
of examples and problems in  
this new manual

Here is a book designed specifically for those engaged in technical fields who need a thorough working knowledge of the principles of mechanics and want to know how they can be applied practically. Easy to read and use, this book is admirably suited for brush-up work and for handy reference use. Employing only simplified mathematics, the volume proceeds from easy to more difficult phases of engineering mechanics, clarifying the principles advanced with numerous clear-cut illustrations. Covering 138 engineering topics, the book helps you to a more thorough knowledge of mechanical engineering principles by demonstrating in great detail their practical application with easily followed examples.

Just Published

## APPLIED ENGINEERING MECHANICS

By ALFRED JENSEN  
318 pages, 6 x 9, 413 illustrations, \$3.00



You need only a basic background in mathematics to follow the hundreds of graphical and analytical solutions to technical problems supplied in this useful manual. Each chapter covers a mechanical engineering subject in statics or dynamics, discusses it thoroughly, then makes it clear by demonstrating the theory advanced in one or more examples. Finally, scores of problems are supplied with over 50% of the answers furnished. These problems are practical in nature, all bearing on actual work in engineering and technical fields.

These 20 chapters show you well-organized methods for solving engineering problems

Introduction	Centroids and Centers of Gravity
Basic Principles of Statics	Moments of Inertia or Areas
Coplanar, Parallel Force Systems	Basic Principles of Dynamics
Coplanar, Concurrent Force Systems	Kinematics of Rectilinear Motion
Coplanar, Non-concurrent Force Systems	Kinetics of Rectilinear Motion
Non-coplanar, Parallel Force Systems	Curvilinear Motion
Non-coplanar, Non-parallel Force Systems	Kinematics of Rotation
Non-coplanar, Non-concurrent Force Systems	Kinetics of Rotation
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PILE driving that's speedy and efficient—that gets construction jobs off to a solid start—is the kind you get with *tapered steel* Monotube piles.

That's why so many experienced engineers

and contractors depend upon them. They've found on job after job that Monotubes have extra advantages on construction projects large and small.

Here's why Monotubes make extra savings:

**They drive faster because of their fluted, tapered construction.**

**They're driven with average job equipment—no core or mandrell needed.**

**They are easily extendible to any required length—right on the job.**

**They're easy to handle—light in weight.**

**Their tubular design permits thorough inspection before concreting.**

For bridges, piers, buildings, airports, and highways—depend upon Monotubes to start construction jobs *right*, to make time-and-money savings. Available in gauge, size and

taper to meet varying soil conditions. For complete information, write The Union Metal Manufacturing Company, Canton 5, Ohio.

**UNION METAL**  
*Monotube Foundation Piles*

# Hand Pressure Can't Stall a *MallDrill*

On the toughest drilling jobs MallDrills will not stall under pressure . . . heat up under load . . . nor require lubrication under continuous use. Any servicing of commutator or changing of brushes can be done without dismantling the drill. A husky 3-jaw geared chuck holds the drill bit firm—preventing slipping and chattering. A trigger switch releases more than enough torque to drill wood, metal or plastics. Five powerful models— $\frac{1}{4}$ " (in two speeds),  $\frac{3}{8}$ ",  $\frac{5}{16}$ " and  $\frac{1}{2}$ " capacities provide a size and type for every drilling job.

*Ask your Supplier or write Contractors' Equipment Division for literature*

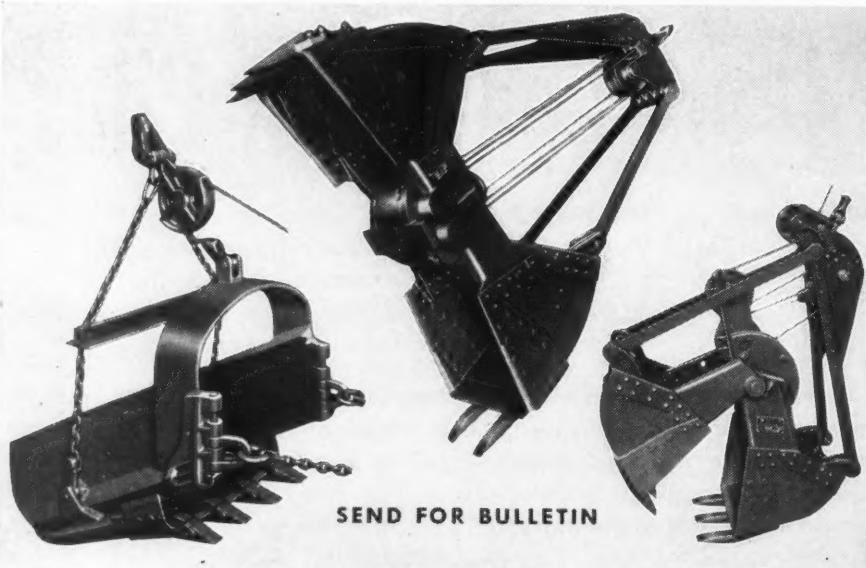
**MALL TOOL COMPANY**

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CHICAGO 19, ILL.

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Advertisement in  
The Saturday  
Evening Post  
—May 10th issue

*Mall*  
REG. U.S. PAT. OFF. **PORTABLE  
POWER TOOLS**



SEND FOR BULLETIN

*For Longer Life!*  
**WELLMAN**  
Williams Type **BUCKETS**

Count on longer life and more efficient service...due to Wellman original **welded rolled steel construction**. You get the maximum digging power, and exceptional strength—without excessive weight! Specify Wellman, and you'll specify the best bucket for your purpose.

**THE WELLMAN ENGINEERING COMPANY**  
2017 CENTRAL AVENUE • CLEVELAND 4, OHIO



**W. W. Paape**, district representative in the Chicago territory, has been promoted to the position of domestic sales manager of the Euclid Road Machinery Co. He will take over his new duties on March 28 at the main offices of the company in Cleveland, Ohio. Mr. Paape has been active in the construction industry for more than 20 years. **E. F. Armstrong**, former sales manager, will devote the major portion of his time to executive and management duties as secretary of the company.

**The board of directors** of the United Engineers and Constructors, Inc., of Philadelphia, Pa., has announced election of **Edward L. Keenan** as vice-president and purchasing agent.

**Skilsaw, Inc.**, Chicago manufacturer of portable electric tools, has announced the purchase of the Forss Pneumatic Tool Co. of Aurora, Ill., manufacturer of a general line of small, portable pneumatic tools. As a result of the acquisition, Skilsaw will be able to supplement its line of portable electric tools with a line of portable pneumatic tools.

**Appointment** of Contractors Machinery Co., Inc., Kansas City, Mo., as distributor of Davey compressors was announced recently by **Paul H. Davey**, president. The new distributor will offer complete sales and service facilities on all items of Davey manufacture.

**George W. Warwick** has been appointed chief engineer of foreign operations for the Armstrong Cork Co., Lancaster, Pa.

**Koehring Co.**, Milwaukee, Wis. is holding the second of a series of training courses designed to supply Koehring distributor salesmen with complete up-to-date sales information on Koehring products. **Arthur E. Loder**, veteran Koehring salesman and Washington representative during the war years, heads a staff of 25 lecturers. Lectures cover the Koehring line of excavators, pavers, Dumptors, Koehring construction mixers, mud-jacks, longitudinal finishers, Kwik-Mix Dandie concrete, bituminous and plaster-mortar mixers.

# *Blending*

## BINDER AND AGGREGATE IRREGULARITIES by CROSS-MIXING



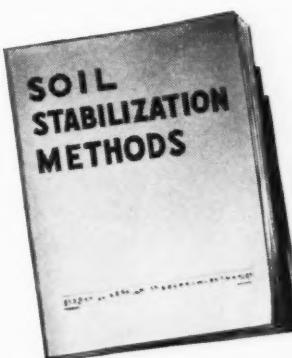
WITH THE

# SEAMAN MIXER

WHEN aggregates vary,—as often occurs load by load, in pit run material and the fines and the coarse lie some distance apart... when, due to accidents in applying bitumen uniformly... when, even with uniform binder application the fines absorb more and the coarse material less,—all these irregularities are easily corrected by cross-mixing with the SEAMAN. Cross-mixing simply means operating the SEAMAN MIXER in zig-zag or crosswise as well as in the longitudinal directions. Due to the "carry" of materials within the hood of the SEAMAN, coarse material is then mixed uniformly with the fines and "rich" and "lean" spots in binder application are successfully blended. Furthermore, shut-downs because of excess moisture in the materials are greatly shortened when the SEAMAN is used,—for its inherent aerating action does a quick job of dehydrating. And in a bituminous mix,—the oxidation of solvents "sets" the treatment faster. What mixing equipment other than the SEAMAN offers such great versatility in economical operation?

It's popularity never lessens! The booklet,—  
"Soil Stabilization Methods" compiled by  
Seaman engineers, is kept up-to-the-minute

with the latest information from the field. Write for  
your copy. Ask for  
Bulletin C-25.



## SEAMAN MOTORS, INC.

PLANT MIX QUALITY AT ROAD MIX COST!

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# MERCER

*"The Name that Carries Weight"*

## MATERIAL HANDLING EQUIPMENT

### TRACTOR CRANES

3 Models — For Loads Up  
to 7 Tons. Write for  
literature.

Special Type Boom

Designed

Solid or Pneumatic Tires

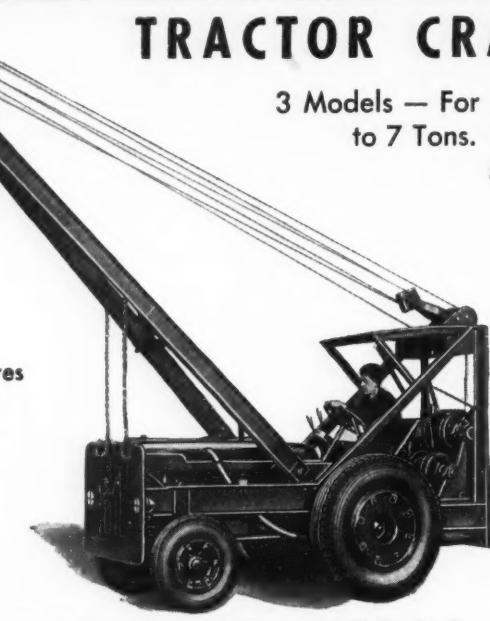
Short Turning Radius

Easy to Operate

Low Up-Keep

Clear Vision

Live Boom



**MERCER ENGINEERING WORKS, INC.**

Plant: Clifton, N. J.

SALES REPRESENTATIVE

**MERCER-ROBINSON COMPANY, INC.**  
**30 CHURCH ST., NEW YORK 7, N. Y.**

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WITH  
**CLIPPER**  
MASONRY SAWS

Cut the desired  
shape or size at a  
moment's notice,  
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GLAZED TILE . . .

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CONCRETE BLOCKS

. . . . or any other  
Masonry Material,  
regardless of hard-  
ness or density.

Offered to You  
on  
**FREE TRIAL**

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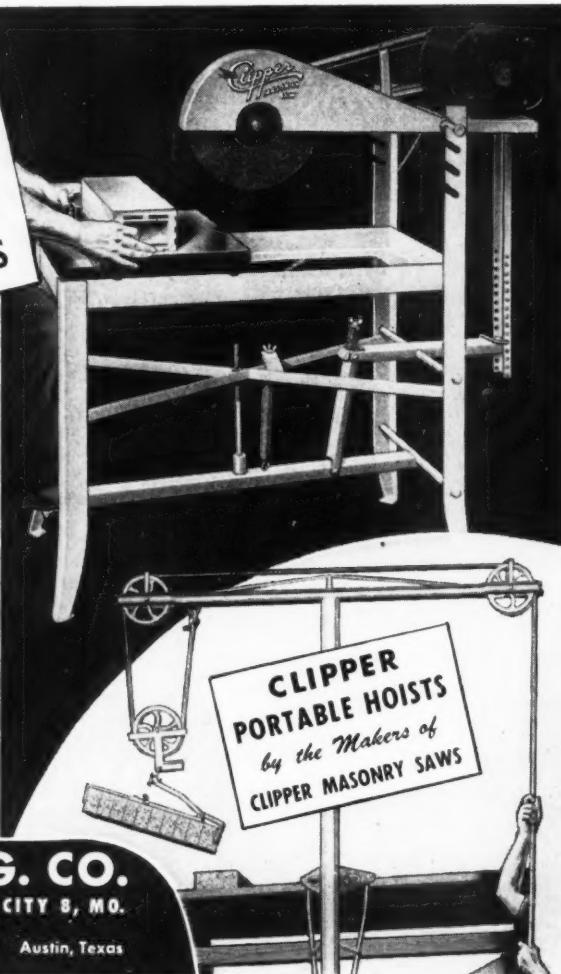
2800 WARWICK • KANSAS CITY 8, MO.

Factory Branches

Philadelphia

St. Louis

Austin, Texas



The Union Wire Rope Corp. has announced expansion of its technical staff, conducting its unique testing and research laboratory. Walter Voightlander, a mechanical engineering graduate of Stevens Institute of Technology and for the past 40 years actively engaged in technical and research work in the wire rope industry, was named technical director. Charles M. Zerr, also a Stevens graduate, and for the past 12 years an assistant to Mr. Voightlander, was appointed chief engineer of the rope division. Other advancements in the enlargement of the company's technical services include: Raymond O. Kasten, assistant technical director; Robert C. Downey, research chemical engineer; Omer Brenton, assistant metallurgist, and Dwain L. Bedford, metallurgist in charge of the chemical, physical and metallurgical functions of the laboratory.

O. W. (Bill) Irwin has become president of The Rail Steel Bar Association with headquarters in Chicago. For the past eleven years Mr. Irwin was manager of sales of the concrete bar division of The Carnegie-Illinois Steel Corp.

Appointment of Earl E. Morgan as general superintendent of The Sawhill Manufacturing Co., Sharon, Pa., is announced by W. D. Reed, vice-president. Mr. Morgan has been affiliated with The National Tube Co. for the past ten years and had previously been employed as an industrial engineer with the U. S. Rubber Co.

Appointment of John C. Campbell as manager of industrial engine sales, and James W. Brown as advertising manager was announced recently by V. C. Genn, general sales manager for the Detroit Diesel Engine Division of General Motors.

The A. O. Smith Corp. has announced that George P. Hough has been appointed executive administrator of the company's Chicago district, taking the position held by Don T. Allen, who resigned recently.

Upon retirement of Frederick J. Schmidt, apparatus and supplies manager of the northwestern district of the Westinghouse Electric Supply Co., B. H. Boatner, former branch manager, at Tampa, Fla., has been appointed to that position. Mr. Boatner is an electrical engineering graduate of the Georgia School of Technology.

*a thousand  
and one...*

# MACWHYTE WIRE ROPES

... all job-proved ... assure  
you the correct rope for your equipment

When you use the correct wire rope, both the rope and your equipment last longer, cost less to operate. Macwhyte consulting engineers will check your equipment and recommend the wire rope specifically engineered for your job. Ask your Macwhyte distributor, or write Macwhyte Company.

## MACWHYTE WIRE ROPE

Manufactured by Macwhyte Company  
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Make

**MACWHYTE**  
your headquarters for  
**WIRE ROPE**  
and **SLINGS**

MACWHYTE PREFORMED AND NON-PREFORMED INTERNALLY LUBRICATED WIRE ROPES... MONARCH WHYTE STRAND Wire Rope... Special Traction Elevator Rope... Stainless Steel Wire Rope... Monel Metal Wire Rope... Galvanized Wire Rope. Macwhyte also makes Atlas Braided Wire Rope Slings, Hi-Fatigue Aircraft Cables, Assemblies, Tie-Rods. Catalogs on request.

PRODUCE A TRICKLE OR A TORRENT

REDUCE A SEEPAGE OR A FLOOD

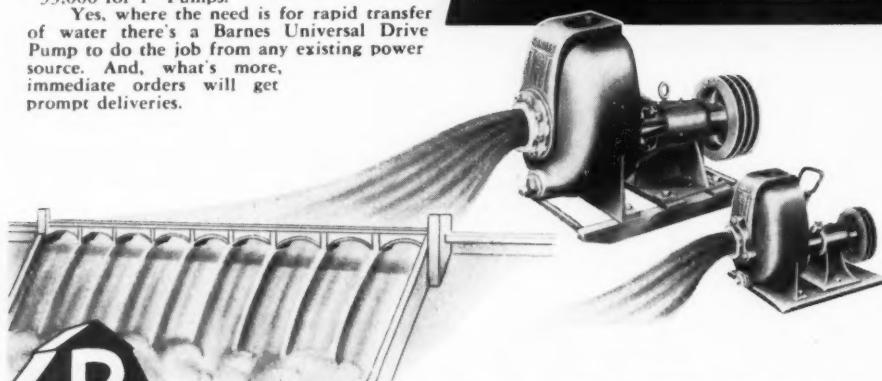
FROM the small-sized, feather-light (35 lbs.) 3MU with its powerful 1½-inch suction to the mighty 90MU which controls a veritable torrent through its massive 6-inch connections, there is now a proper sized Barnes Universal Drive Automatic Centrifugal Pump for any requirement.

Eight capacities of from 3,000 to 90,000 gallons per hour, and five suction and discharge sizes of from 1½ to 6 inches, fill a complete new line of Universal Drive Automatic Centrifugals that are a "must" for contractors, industrial plants, municipalities, mine operators, farmers, gardeners and wherever a power source is available. Each Barnes Universal Drive Automatic will deliver top performance when belt-driven from tractor, jeep or any other gasoline engine, or when shaft-coupled directly to electric motor. These powerful new Centrifugals have the same Automatic Prime, Barnes Super-Seal, Direct Flow Suction, Non-clogging Impeller and all other fine features found in Barnes famous "33,000 for 1" Pumps.

Yes, where the need is for rapid transfer of water there's a Barnes Universal Drive Pump to do the job from any existing power source. And, what's more, immediate orders will get prompt deliveries.

Barnes New  
Universal Drive  
Pumps Now Sized

for Any Job



**D BARNES MANUFACTURING CO.**

Quality Pump Manufacturers for 50 Years

MANSFIELD, OHIO

**CONTRACTORS RUBBER PRODUCTS**  
available from Stock for immediate Delivery

**CONVEYOR, ELEVATOR and  
TRANSMISSION BELTING**

all widths and plies

**V-BELTS** all sizes

**HOSE** all sizes

AIR	WATER	SUCTION	COMPRESSOR
FUEL	STEAM	WELDING	PILE DRIVERS
FIRE	VACUUM	DISCHARGE	ROAD BUILDERS

and BOOTS, DREDGE SLEEVES, PUMP DIAPHRAGMS, ETC.

and everything rubber for Industrial Requirements

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Write for new catalog

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Phone: BARclay 7-9793

**RUBBER  
CO., Inc.**

Because of the rapidly expanding business activity in the Southwest, Cutler-Hammer, Inc., Milwaukee, Wis., manufacturers of electric motor control and allied products, has established Dallas, Tex., as a new district sales territory, replacing the former branch sales office operation. The district will be under **E. K. Anderson**, district manager, at 715-A N. Ervay St., Dallas, and includes Texas, Oklahoma, Arkansas and southern New Mexico. **J. S. Darby** will be in charge of the company's branch sales office in Houston, and will operate under the supervision of the Dallas Office.

The **Hugh B. Williams Manufacturing Co.**, of Dallas, Texas, has announced that the Joslyn Companies, distributors of pole-line equipment, have been appointed distributors of the Hole Digger on a nation-wide basis. The digger is a heavy-duty machine, manufactured in three sizes, to dig inclined or vertical holes up to 20 ft. deep and from eight to 36-in. in diameter.

Continuing current nationwide expansion of its sales division, Independent Pneumatic Tool Co., Chicago, Ill., manufacturer of Thor portable pneumatic and electric tools, announced the appointment of **J. A. Hill**, formerly manager of its New York branch office, as manager of electric tool sales, and the opening of a new branch office in Cincinnati at 426-428 Elm St.

James M. Borror has been appointed Northwest district representative of The Galion Iron Works & Mfg. Co., covering the states of Washington, Oregon, Idaho, Montana, and Wyoming.

Duke Equipment Co., Ltd., of Montreal, Canada, has elected J. A. Salat as president. He was formerly manager of this company.

Two huge boilers of 25,000 sq. ft. each, manufactured by the Pacific Boiler Division of the United States Radiator Corp., will be installed soon on the roof of the 18-story Kirby Building in Dallas, Tex., in a departure from ordinary heating techniques. Steam will be fed down instead of up. The installation was made necessary by the high rental value of the building's basement, which is occupied by a large department store. The building formerly was supplied with heat from an adjacent structure.



(Isotherm Adsorption Apparatus)

# Mystic Maze

Seen through this mystic maze of tubes and wiring is a Sinclair Research technician. What his apparatus means to users of industrial lubricants is no mystery, however.

At Sinclair Laboratories, the Isotherm Adsorption Apparatus is used constantly to determine the effectiveness of adsorbents used in lubricating oil refining procedures. Because Sinclair lubricants are made with infinite care to suit the specific requirements of your equipment, it is highly important to know exactly how adsorbents, catalysts, and other treating materials perform in a refining process.

This intricate apparatus is an assurance that Sinclair lubricant manufacture guarantees the very highest quality product. It is one more evidence of the painstaking Sinclair research and refinery control that result in outstanding lubricant performance.

## Sinclair Automotive Oils

For Bus, Truck and Tractor

### OPALINE TRUCK BUS TRACTOR MOTOR OIL

Superior lubrication in the long pull, under heavy loads

Keeps engines clean...  
Sustains top engine performance

SINCLAIR REFINING COMPANY • 630 FIFTH AVENUE, NEW YORK 20, N.Y.

# SINCLAIR

## Lubricants for Industry

FINEST CRUDES + EXPERT RESEARCH

and MANUFACTURING CONTROL = OUTSTANDING PERFORMANCE

# SYNTRON

**100% Self-Contained  
Gasoline Hammer**

## **PAVING BREAKERS**



**No  
Compressor**

**No  
Hose**

**No  
Battery Box**

**No  
Cable**

**BUST** Concrete

**CUT** Asphalt

**DIG** Shale, Clay

**TAMP** backfill

Powerful, hard-hitting tools that will pay for themselves again and again in money and time saved.

See your equipment dealer, or  
Write for illustrated folder

**SYNTRON CO.**

500 Lexington, Homer City, Pa.



**Portable Products Corp.**, of Pittsburgh, has opened general sales offices in the Woolworth Building, New York City, to correlate sales activities for the eight divisions of the corporation. These include the Portable Safety Division, Pittsburgh, Pa., manufacturers of safety belts, hats and the like, and American Pad & Textile Co., Greenfield, Ohio, makers of marine life jackets and outdoor equipment. **John C. Sykora**, vice-president and director of sales is in charge of the New York office.

**Clinton T. Hallsted** has been appointed manager of the American Lumber and Treating Co.'s San Francisco sales office, located at 604 Mission St., succeeding **Marx Hyatt** who headed the San Francisco office for seven years and is entering business for himself. Mr. Hallsted will be responsible for sales of the various treating services available at the American Lumber and Treating Co.'s Wauna, Ore., and Weed, Calif., plants.

**George A. Hays** has been appointed vice-president and general manager of the Hinderliter Tool Co., a division of H. K. Porter Co., Inc., at Tulsa, Okla., following the retirement of **Frank J. Hinderliter**, who founded the company in 1920, it was announced today by **T. M. Evans**, president. This company manufactures oil field drilling equipment.

## **Norfolk Pier Project**

(Continued from page 100)

rod hangers and loosening the toggles and clamps. Supporting timbers are lowered sufficiently for removal of the forms panels and the lighter framing, after which they are dropped in the water and floated from beneath the pier. To facilitate stripping of the culvert-shaped track forms, beams and offsets are battered  $\frac{5}{8}$  in. Form life averages nine uses.

Concrete for the pier deck totals 24,200 cu. yd., and is pumped to the forms from the central plant. Like the pile concrete, the mix contains 1 lb. of Pozzolith per bag, but is 3,000-lb. concrete, approxi-

(Continued on page 170)

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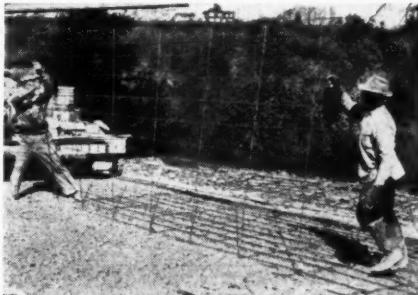
Whenever you need dependable steel for road- or bridge-building, get in touch with Bethlehem. Bethlehem's line of steel products for highways is complete. It contains practically everything you require, from drill steel to guard rail, to complete any highway contract.

You'll find it convenient to order all your requirements from Bethlehem, too, for Bethlehem makes it a point to work closely with contractors. Each order is handled as a unit, with individual items scheduled for delivery when needed.

Shown here are some of the Bethlehem road steel items which you will find giving a good account of themselves in scores of road-building projects during coming months. Complete information is available on request.



**WELDED FABRIC**—Bethlehem Electric Welded Fabric is excellent for use in reinforcing concrete roads and pavements. Of square or rectangular mesh, it is made from cold-drawn steel. Comes in rolls or sheets, and in various combinations of wire-spacings.



**HINGED BAR MATS**—An effective means of reinforcing road slabs. Bethlehem Hinged Bar Mat is handled by two men. Folds to about half the standard mat size, making it easy to truck without exceeding road-width limits. Meets state specifications.



**DRILL STEEL**—Need a tough drill steel for making shot holes? Use Bethlehem Hollow Drill Steel. It stands severe usage, is equally suitable for forged-on bits or detachable bits. Bethlehem also supplies Solid Drill Steel for such items as pinch bars, moil points and chisels.



**WIRE ROPE**—You can count on A-1 wire-rope performance when you team up with Bethlehem's Purple Strand for shovels, dragline excavators, scraper wagons and cranes. It has exceptionally high resistance to wear and fatigue. For best results use Purple Strand in the Form-Set (preformed) construction.



**GUARD RAIL**—Bethlehem Safety-Beam Guard Rail affords maximum protection to motorists. Its sections lock together to form a continuous beam, impact being absorbed not by one, but by several adjacent posts. This efficient guard rail comes in lengths up to 50 ft.

**Bethlehem Steel Company, Bethlehem, Pa.**

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ROAD JOINTS	REINFORCING BARS	BAR MATS
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(Continued from page 168)

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. . . and STOW Flexible Shafts give the STOW Concrete Vibrator outstanding dependability—helps you meet quality specifications every time!

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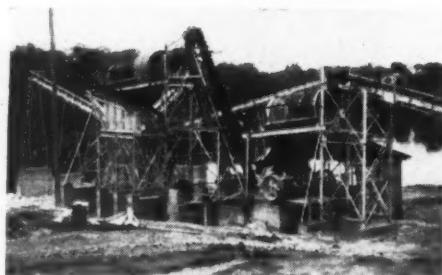
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mately 1:2½:3½. Each 1¼-yd. batch contains 2,450 lb. of stone, 1,660 lb. of sand, 705 lb. of cement, 3¾ gal. of Pozzolith slurry and 26 gal. of water.

The pier and warehouse is being built by McLean Contracting Co., Baltimore, with Grover C. Denny general superintendent in charge. L. J. Hartman is superintendent, and F. J. Morrison, engineer for McLean. The work is under the general direction of W. P. Wiltsee, chief engineer of the Norfolk & Western Railway Co., A. B. Stone, assistant chief engineer, and H. F. Smith, bridge engineer, all with offices in Roanoke, Va. J. Y. Neal is assistant engineer in charge and W. I. King is resident engineer in the field for the railway.

## P. R. R. TUNNEL

(Continued from page 105)

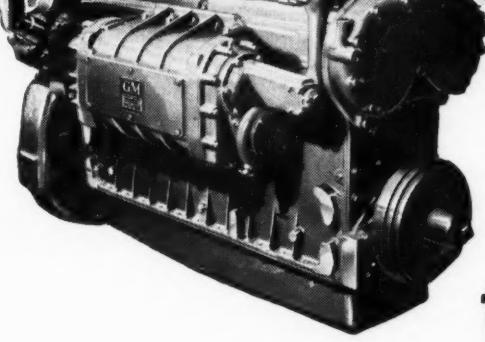
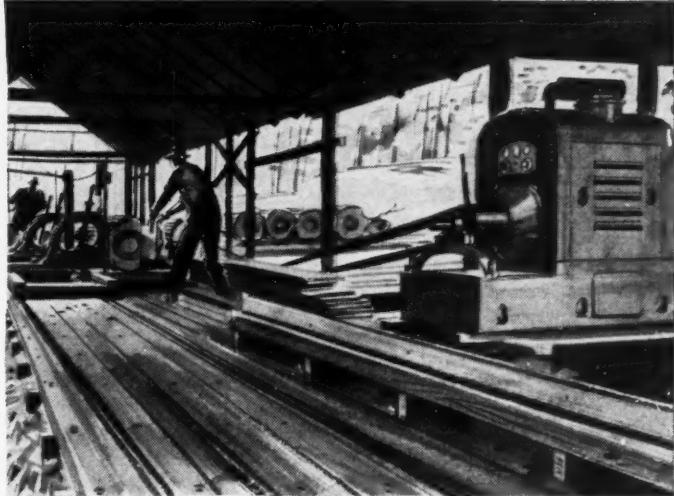
roughly 36 ft. wide by 32 ft. high—dimensions slightly greater than those ordinarily found in double-track tunnels—resulted in a more favorable bid price for excavation, according to Col. Lorence, by offering increased space for drilling and mucking. Unit contract price for tunnel excavation on this project is \$8.50 per cu. yd.

The pilot tunnel, measuring roughly 15 ft. square, was driven from west to east, with three 8-hr. shifts averaging 25 ft. per day. No timbering was needed as the material is hard sandstone, siltstone and indurated clay. Forced ventilation was provided at all times by a large blower fan and a 26-in. dia. air line extending nearly to the heading. A five-drill jumbo enabled the contractor to drill from 45 to 50 holes, each about 10 ft. deep from one setup. An 8-ft. effective blasting depth created sufficient spoil for removal during one 8-hour shift. Muck was loaded by a Conway mucker into 5-yd. narrow-gage cars.

**Drill 20 ft. per Day** — No forced ventilation is required in the main bore because of the existence of the pilot tunnel. The main bore also is being drilled from west to

(Continued on page 172)

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## Takes any job in its stride *because—* there's power at every downstroke

**I**N many industries, the best power plant is one that picks up its load fast.

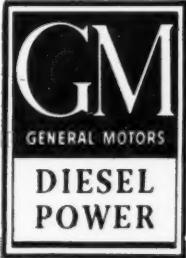
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(Continued from page 170)

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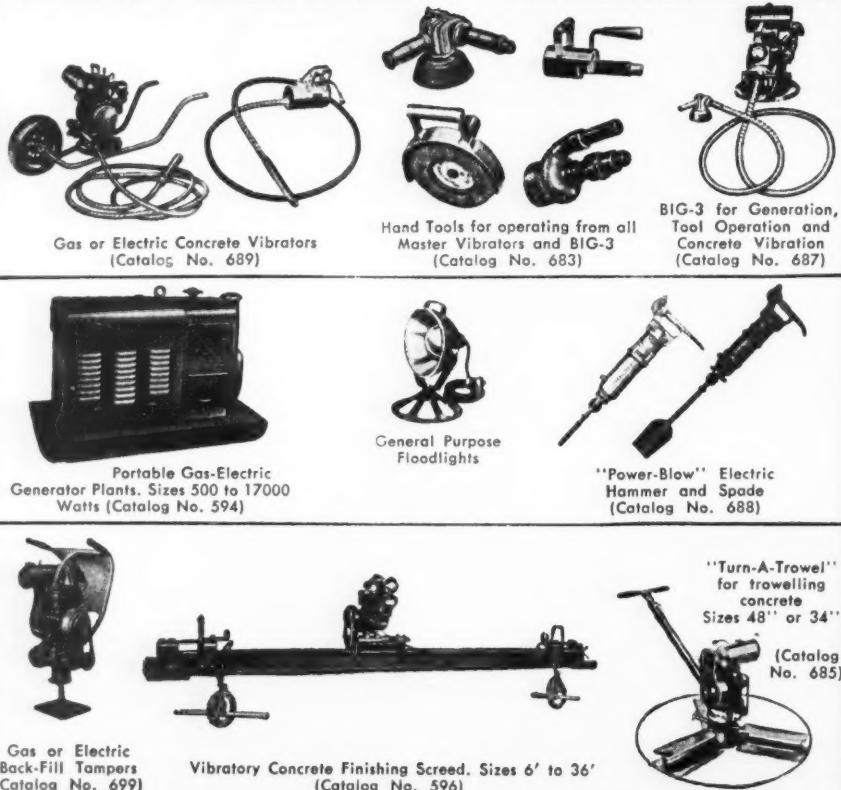
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east, and at an average rate of 20 ft. per day. All drilling is with a jumbo drill carriage operating on railroad rails and carrying nine Ingersoll-Rand drifters. Air for drilling is furnished by one Ingersoll-Rand and two LeRoi compressors, each of 500 cfm. capacity.

In the main bore a total of 80 holes is drilled at each setup—60 around the arch of the tunnel and 10 on each side. They are drilled 20 ft. deep and produce an effective blasting depth of 18 ft. Each hole is loaded with 12 lb. of 45-percent strength dynamite, either Hercules Gelamite No. 2 or DuPont Gelex No. 2. Blasting production averages 1 cu. yd. of excavation for 1 lb. of dynamite.

**Electric Mucking Shovel** — All mucking in the main bore is by a 1½-yd. electric Lorain power shovel aided by a D-7 Caterpillar bulldozer that operates in the pilot tunnel to push the broken rock out for easy loading by the shovel. Haulage is by three 13-cu. yd. diesel Euclid trucks and one HD-10 Allis-Chalmers tractor with 8-cu. yd. Continental scraper. Tunnel muck is wasted a short distance from the west portal.

The drill crew includes 9 miners and 9 helpers, 1 compressor man, 1 machine operator, 1 powder man, 2 laborers and 1 foreman. The mucking crew includes a foreman, 1 shovel operator, 2 tractor operators, 1 oiler, 2 scalers, and 3 truck drivers.

**Sequence of Operations**—Drilling, blasting and mucking operations are set up for maximum efficiency on a schedule that permits one cycle each 24 hr. The mining crew reports at midnight and completes drilling of the eighty 20-ft. holes in 5 or 6 hr. The drill carriage then is retracted about 100 ft. from the heading and the holes are loaded in an hour or more. The tunnel is cleared of all workmen and the daily blast is set off between 7 and 8 a.m. After a short interval the muckers and scalers go to work and continue until all loosened rock has been removed, which usually takes about 9 hr. Operations then cease until the miners return at midnight.

Present plans are for the main bore to be holed through by June 15, 1947. Concreting of the lining is expected to be started by July 15, and the entire tunnel is scheduled for completion by Jan. 1, 1948.

**Don't buy a pump by the "fitting" in front**



THE "fitting" in front may be misleading. Often, it's what you don't see that makes the difference between a fortunate and unfortunate choice in suits. In pumps, too, suction and discharge sizes may appear to "fit" your pumping requirements. But pump "sizes" don't always assure pump performance. It's what a pump will do that counts.

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## USES

**PRIMACORD** is used as a detonating fuse for TNT, demolition blocks or other explosives and is more dependable than electrical fuses for insuring the simultaneous detonations of a number of charges assembled on a single line.

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Offers to purchase all or any part of the above material, f.o.b. location, will be accepted until noon June 25, 1947, by the Regional Office having the inventory. WAA reserves the right to reject any or all offers, to make awards in whole or in part, or to extend the period of the sale. Material is subject to withdrawal prior to contract of sale.

This is a concurrent and continuous sale; 5% of the total inventory will be reserved to fill orders received from Federal Agencies by noon on June 25, 1947. All other orders received by noon on this date will be filled in the following sequence: (a) Certified veterans of World War II, (b) Subsequent priority claimants, (c) Non-priority purchasers.

All orders received after this date will be filled without regard to priorities. Purchaser's order must state thereon: (a) "This order is subject to War Assets Administration Standard Conditions of Sale, and all other advertised terms and conditions, and no other terms or conditions should be binding on War Assets Administration", (b) Type of business and level of trade. Orders from veterans must show certification date, case number and location of certifying office.

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Nashville	2,160,100	18,658	12,262	1
Omaha	148,700	—	—	—
Philadelphia	503,300	10,066	—	—
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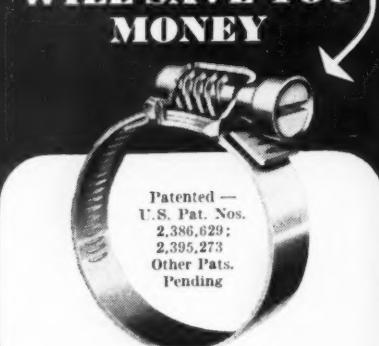
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Save time. Easily installed. No need to remove hose. Self-locking. Will not collapse thin wall hose.

**REDUCE MAINTENANCE COSTS!**

They "stay put". Leak-proof. Extra long take-up. Reduce inventory requirements. Keep equipment on the job. Use them for all air, fuel and coolant lines on trucks, tractors, pumps, mixers, compressors, power shovels, motor graders, etc. Write for FREE SAMPLE. You'll like "Aero-Seal".

**AIRCRAFT STANDARD PARTS CO., INC.**  
 1715 19th Avenue  
 Rockford • Illinois

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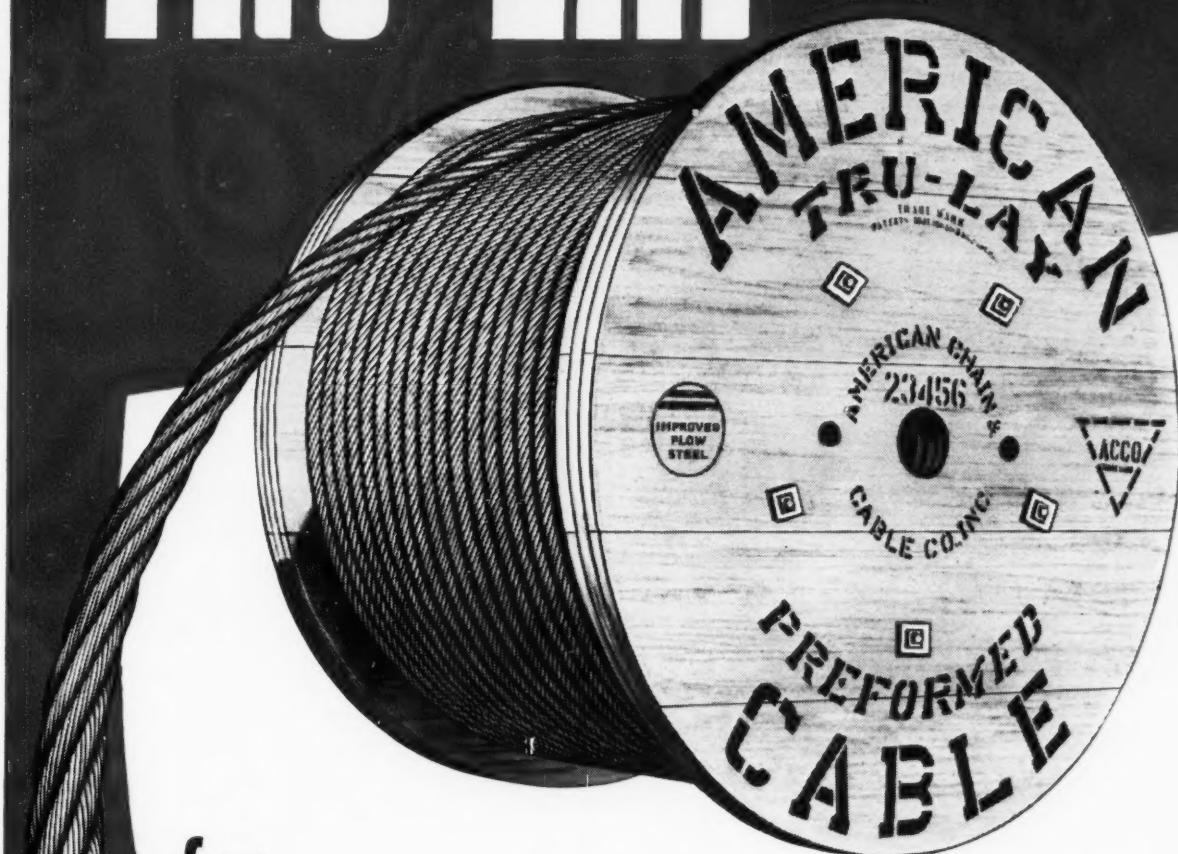
## Worthington-Ransome Blue Brute Distributors

See ad on page 4th Cover for list of equipment in each line

### Worthington-Ransome Distributors

Ala., Birmingham, Construction Equipment Co.
Montgomery, Burford-Toothaker Tractor Co.
Alaska, Anchorage, Airport Mach. & Storage Co.
Ariz., Phoenix, Lee Redman Equipment Co.
Ark., Fort Smith, R. A. Young & Son
Little Rock, R. A. Young & Son
Cal., L. A. Golden State Equip. Co.
San Francisco, Coast Equip. Co.
Colo., Denver, Power Equipment Co.
Conn., Wallingford, Wilhelm-Davies Co., Inc.
Fla., Gainesville Constr. Equip. & Supply Co., Ltd.
Fla., Miami, Allied Equip., Inc.
Orlando, Highway Equipment and Supply Co.
Tampa, Epperson & Company
Ga., Atlanta, Tractor & Machinery Company
Ida., Boise, Olson Manufacturing Co.
Ill., Chicago, Chicago Construction Equip. Co.
Ill., Chicago, Thomas Hoist Co.
Ill., Chicago, J. A. Roche
Iowa, Cedar Rapids, McNall Mach. & Supply Corp.
Ky., Harlan, Croushorn Equip. & Supply Co.
Louisville, Williams Tractor Co.
Maine, Portland, Maine Truck-Tractor Co.
Mich., Muskegon, Lakeshore Machy. & Supply Co.
Minn., Minneapolis, Phillip-Murphy Equip. Co.
Miss., Jackson, Jackson Road Equip. Co.
Mo., Clayton, The Howard Corporation
Mo., Kansas City, Mach. & Supplies Co.
St. Louis, W. H. Reaves
Montana, Billings, Interstate Truck & Equip. Co.
Helena, Caird Eng. Works
Nevada, Elko, C. W. Paul Hardware and Machy. Co.
N. J., No. Bergen, American Air Comp. Corp.
N. M., Albuquerque, Bud Fisher Co.
Roswell, Smith Machy. Co.
N. Y., Albany, Milton-Hale Machinery Co.
New York, Dodge & Hammond, Inc.
New York, Railroad Materials Corp.
Syracuse, Milton-Hale Mach. Co.
N. C., Raleigh, Smith Equip. Co.
N. D., Fargo, Smith Commercial Body Works, Inc.
Ohio, Cincinnati, Carroll-Edwards & Co.
Dayton, Carroll-Edwards & Co.
Ohio, Toledo, The Kilcorse Machy. Co.
Okl., Oklahoma City, Tattan-Douglas Equip. Co.
Oregon, Portland, Andrews Machinery
Pa., Wilkes-Barre, Ensminger & Co.
Mechanicsburg, Amer. Equip. Corp.
Philadelphia, Metalweld, Inc.
S. C., Columbia, Smith Equipment Co.
Tenn., Knoxville, Dempster Bros., Inc.
Memphis, Independent Tractor Co.
Nashville, Dempster Bros., Inc.
Tex., Amarillo, T. W. Carpenter Equip. Co.
Dallas, Shaw Equip. Co.
San Antonio, Patten Machy. Co.
Tyler, D. M. McClure Equip. Co.
Utah, Salt Lake City, J. K. Wheeler Mach. Co.
Vt., Barre, A. M. Flanders, Inc.
Va., Richmond, Highway Machy. and Supply Co.
Wash., Spokane, Andrews Equip. Service
W. Va., South Charleston, Allied Equip. Co.
Wisc., Milwaukee, Drott Tractor Co., Inc.
 <b>Ransome Distributors</b>
D. C., Washington, M. A. Doetsch Mach. Co.
Ia., New Orleans, Ole K. Olson Co.
N. D., Baltimore, Stuart M. Christoffel & Co.
Mich., Detroit, Thomas G. Abrams
N. Y., Buffalo, Murray Equip. Co.
N. Y., Rochester, B-G Equip. Co.
Ohio, Cleveland, H. B. Fuller Equip. Co.
Pa., Pittsburgh, Arrow Supply Company
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Mass., Cambridge, Field Mach. Company
Mich., Detroit, W. H. Anderson Co., Inc.
Flint, Grandsen-Hall & Co.
N. Y., Buffalo, Dow & Co., Inc.
New York, Air Compressor Rental and Sales
O., Cleveland, Gibson-Stewart Co.
Pa., Allentown, H. N. Crowder, Jr., Inc.
Pittsburgh, Atlas Equip. Corp.
Texas, El Paso, Equip. Supply Co.
Washington, Seattle, Star Machinery Co.
Wyoming, Cheyenne, Wilson Equip. & Supply Co.
 <b>Buy Blue BRUTES</b>
Worthington Pump and Machinery Corp.
Worthington-Ransome Construction Equipment Division
Holyoke, Massachusetts

# TRU-LAY Preformed



for  
**DRAG LINES**

Because American Cable TRU-LAY is preformed, the wires and strands are free from internal strain. This makes TRU-LAY a limber rope, ready for fast unwinding. It whips less—runs out truer. Your men get better casts. They can make top speed with the load, too, because it is a characteristic of TRU-LAY Preformed to spool smoothly on the drum. Being an extremely flexible line, TRU-LAY Preformed better withstands bending fatigue and so lasts longer, steadies machine production, moves more yards per rope, gives greater dollar value. If you have drag-line work to do, by all means specify TRU-LAY Preformed of Improved Plow Steel.

ACCO

Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco, Tacoma, Seattle, Bridgeport, Conn.

AMERICAN CABLE DIVISION  
AMERICAN CHAIN & CABLE



In Business for Your Safety

# TO BEAT YOUR ESTIMATE WHEN THE GOING GETS TOUGH



Two Ransome 34E Single Drum Pavers, owned by J. A. Utley Company,  
Michigan contractor, delivering concrete directly into forms

Concrete for this big Michigan auto factory site was batched at a central mixing plant. Ground conditions kept truck mixers from getting close to the forms. Bridging the gap with crane-carried buckets would have shot costs up far beyond the estimate. So . . .

Ransome Blue Brute Pavers were called in. From well back of the excavated dirt mounds their "live booms" swung their hydraulically-controlled buckets directly over the forms. Spillage was eliminated by the bucket's hydraulic shut-off when the forms were filled . . . Another construction problem solved!

#### More About the "Live Boom"

It spreads over a wider area with every swing, eliminating hand shoveling . . . Boom can be elevated to 9-ft.

clearance under bucket, while paver concretes retaining walls, etc., and lays the slab — all in one operation. *Only Ransome Pavers include the "live boom" as standard equipment.*

#### Get the Whole Story

Many other advanced features show why 34E's—Single Drum and Dual Drum—are preferred equipment on big construction jobs . . . highways, dams, reservoirs, airport runways, foundations, piers . . . saving costs with every cubic foot of concrete placed. Write for facts on how these famous Ransome Pavers can make more profits for you with their high-speed operation and their low maintenance cost . . . proving *there's more worth in a Blue Brute.* R7-5

#### KNOW YOUR

## BLUE BRUTES

Your Blue Brute Distributor will be glad to show you how Worthington-Ransome construction equipment will put your planning on a profitable basis. His name is listed on Page 176.

#### RANSOME EQUIPMENT

Pavers, Portable and Stationary Mixers, Truck Mixers, Pneumatic Placing and Grouting Equipment and Accessories.

#### WORTHINGTON EQUIPMENT

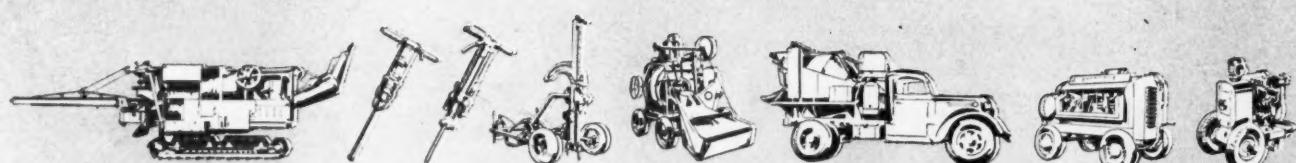
Gasoline and Diesel Driven Portable Compressors, Rock Drills, Air Tools, Self-Priming Centrifugal Pumps and Accessories.

#### WORTHINGTON



Worthington Pump and Machinery Corporation, Worthington-Ransome Construction Equipment Division, Holyoke, Mass.

## BUY BLUE BRUTES

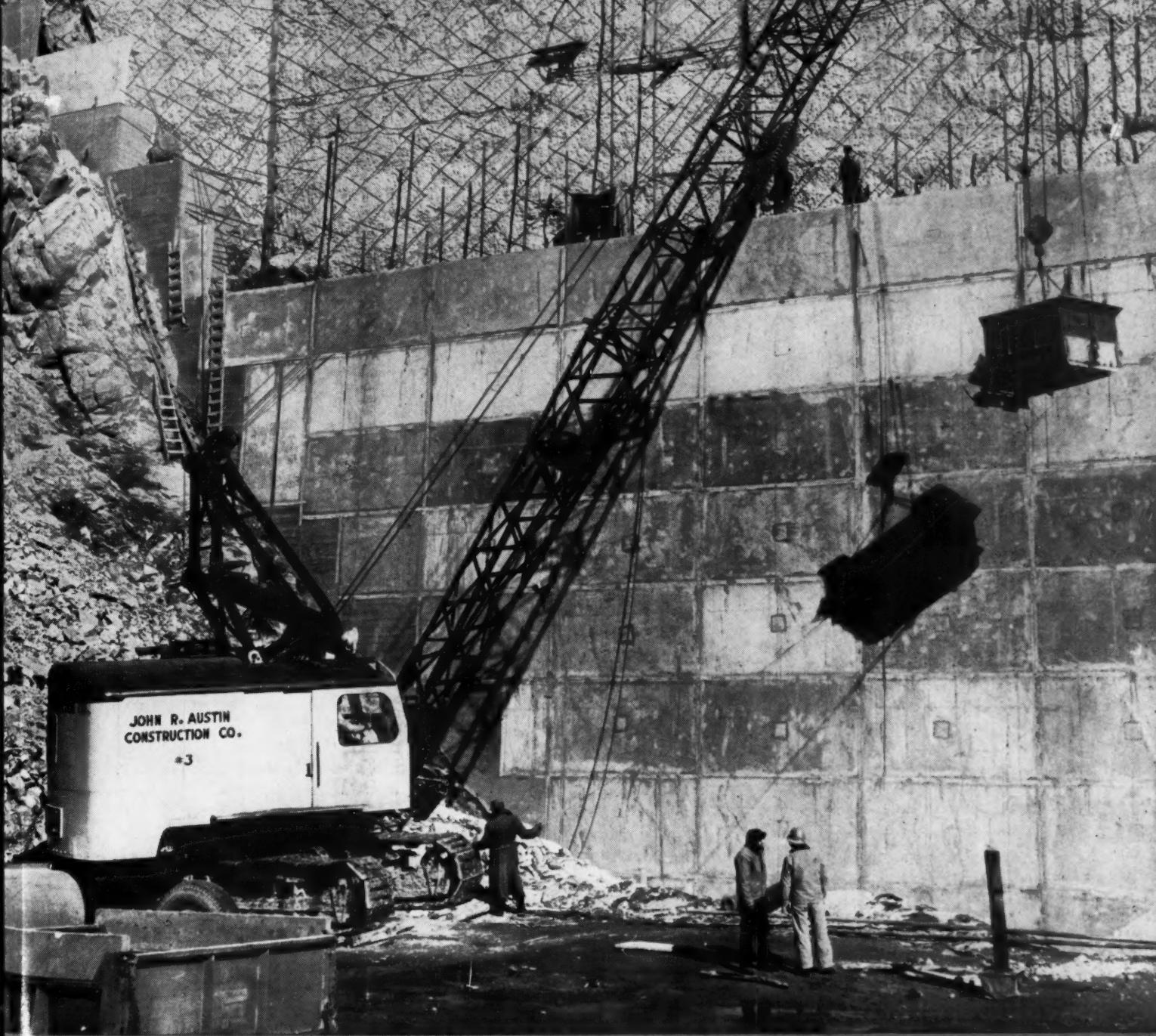


IF IT'S A CONSTRUCTION JOB, IT'S A BLUE BRUTE JOB

JUNE 1947

# Construction Methods

A McGRAW-HILL PUBLICATION



Crane hoists gravel for grouted backfill behind new precast slab face of Barker Dam in Colorado

Hoover Dam Tunnel and Tailrace Changes • Heavy Equipment on Boston Building Foundation  
Precast Slab and Grouted Gravel Face for Barker Dam • Britain Builds 13,000 Precast Houses  
Clever Forms for Brooklyn Housing • New Deck on Eads Bridge



EASIER TO TIE  
★  
GREATER  
BONDING STRENGTH

FOR SAFE FLOORING  
USE INLAND  
4-WAY FLOOR PLATE



....

**with Inland HI-BOND  
Reinforcing Bars**

Notice the closely spaced, double helical ribs on a Hi-Bond reinforcing bar. When these bars are tied together, side by side or at right angles, the ribs interlock with each other and provide a firm anchorage for the tie wires. That's why only one strand of wire is needed to make a firm joint—saving time, wire, and labor costs.

The unique rib construction of Hi-Bond bars also provides a greater bond between the steel and concrete, resulting in a more efficient structure through the improved transfer of stresses. It also reduces the width of cracks in the concrete and reduces the need for hook anchorage. Yet for all its advantages, Hi-Bond costs no more than other reinforcing bars.

Unfortunately, present demand greatly exceeds supply. However, to make larger tonnages of Hi-Bond available to you, we have licensed other steel companies to make this superior bar.

**INLAND STEEL COMPANY, 38 South Dearborn St., Chicago 3, Ill.**  
Offices: Detroit, Indianapolis, Kansas City, Milwaukee,  
New York, St. Louis, St. Paul

OTHER PRODUCTS: BARS • STRUCTURALS • PLATES • SHEETS • STRIP  
TIN PLATE • PILING • FLOOR PLATE • RAILS • TRACK ACCESSORIES

**INLAND  
STEEL**

A. E. PAXTON, Publisher

# Construction Methods

THE CONSTRUCTION MAGAZINE WITH PICTURE POWER

Established 1919

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Foreign News Bureaus: London • Paris • Berlin • Prague • Moscow • Shanghai • Bombay • Mexico City

JUNE 1947 Volume 29 • Number 6

**CUTS AND FILLS**

GREATEST ROAD SHOW in the long history of these spectacular construction equipment exhibitions is promised by A.R.B.A. for July 16-24, 1948 at Chicago. An outdoor show at Soldier Field, with almost unlimited space available, will give the manufacturers an opportunity fully to display their products. Ample indoor space will house those exhibits requiring cover. Though coming in the busy construction season, the new nine-day schedule will allow organizations to send several representatives at different times. All in all, it looms up as a great spectacle, a show of construction's might to America and the world.

IT'S HOOVER DAM AGAIN, following a Congressional resolution changing the name of the famous project back to that it carried during the early construction stages. Boulder Dam never was an appropriate name, for the dam is actually in Black Canyon, several miles from Boulder Canyon, once considered as a possible site. Therefore, our lead article in this issue calls the dam by its new and proper name.

IT HAS BEEN COMMON KNOWLEDGE and accepted as inevitable, Lloyd A. Blanchard told the Massachusetts Safety Conference recently, that contractors make allowances of from 8 to 12 percent in their bids to cover the cost of accidents. The sad commentary on this practice, he said, is the apparent indication that contractors do not know their accident costs; otherwise they would not permit such a diversion of potential profit. Why do so many contractors fail to charge their supervisors with specific responsibility for accidents that occur under their jurisdiction, just as they hold them responsible for production, completion schedules, payrolls and materials—all factors that determine profit or loss on the job?

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PUBLIC LIBRARY

JUN 12 1947

DETROIT

PAUL BUNYAN excavated the Grand Canyon, according to legend, but the exact methods and equipment he used have never been accurately determined. This information is now desired by a French company, according to our good friends the Macco Corp., West Coast contractors, who received a request for more information on

a canal excavator described some time ago in this journal, and "a larger one used by Mr. Paul Bunyan in the digging of the Grand Canyon." Perhaps our readers can help us out. Macco's only recollection of Paul Bunyan's equipment is the 4-*yd.* dual-drum paver used to mix pancake batter for his crews.

McGRAW-HILL PUBLISHING COMPANY, INC. • 330 WEST 42nd STREET, NEW YORK 18, N. Y.

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CHANGE  
ADD RES S

Director of Circulation,  
Construction Methods,  
330 West 42nd Street,  
New York 18, N. Y.

Please change the address of my Construction Methods' subscription.

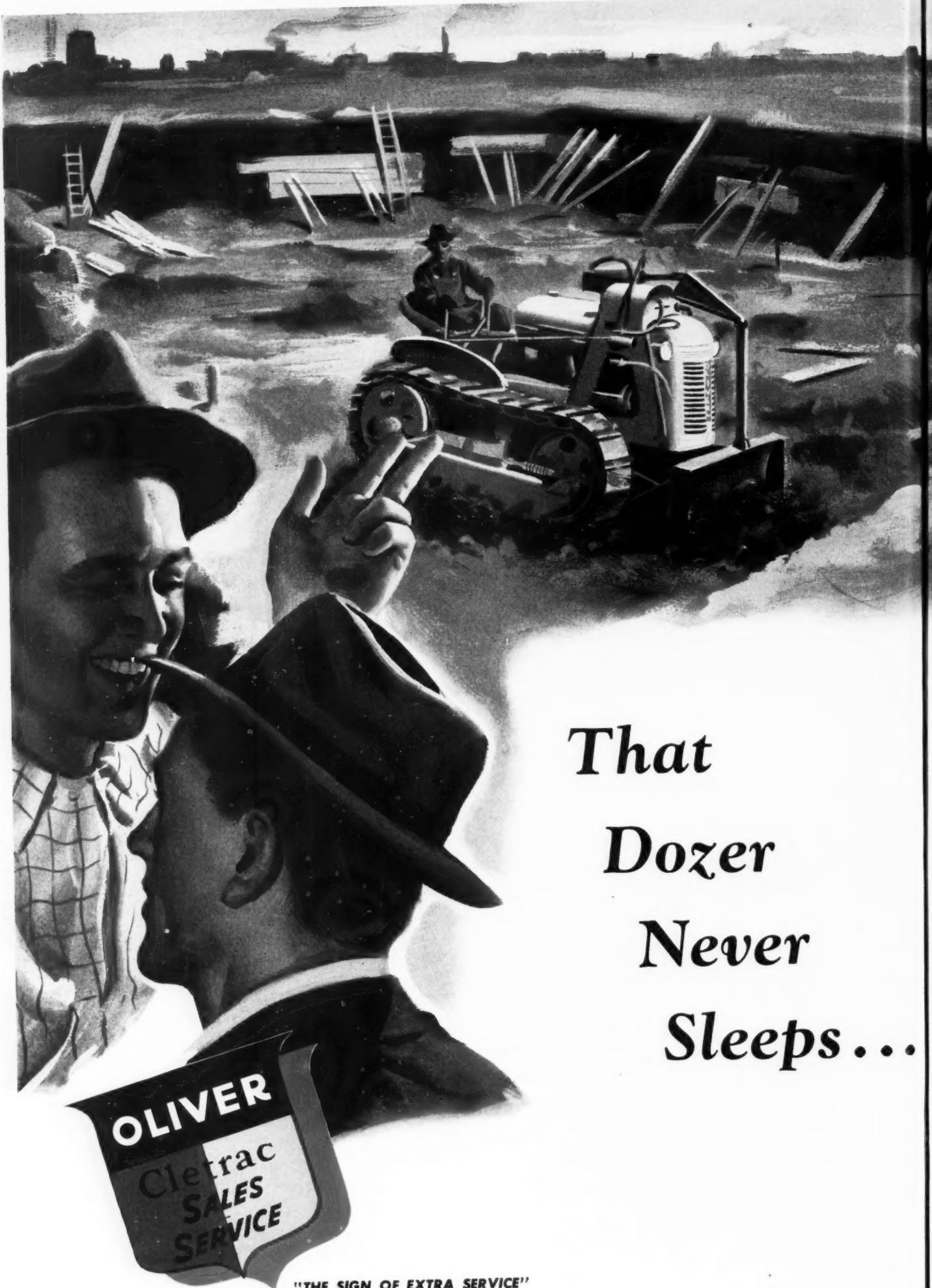
Name .....

Old Address .....

New Address .....

New Company Connection .....

New Title or Position .....



That  
Dozer  
Never  
Sleeps...

OLIVER

Cletrac  
SALES  
SERVICE

"THE SIGN OF EXTRA SERVICE"



There seems to be no limit to the number of jobs that little Cletrac Imp dozer can do. Why, it seems that every day we find some new job it fits to a "T."

It's been a real time and cost saver, and our Oliver "Cletrac" dealer really rang the bell when he said it would be a "handy man" for our work. He happened to be out one day when we were digging a foundation and remarked about the amount of heavy equipment we had. "You know," he said, "we've got a little unit that might save you a lot of time and money. It's a small hydraulic bulldozer that mounts on the Oliver HG . . . the smallest track tractor in the field. We call it the 'Imp.' It's small enough to do a lot of those jobs without the higher operating costs of a big tractor-dozer unit. And you can get it into places where the big tractors can't operate so you can eliminate a lot of hand labor."

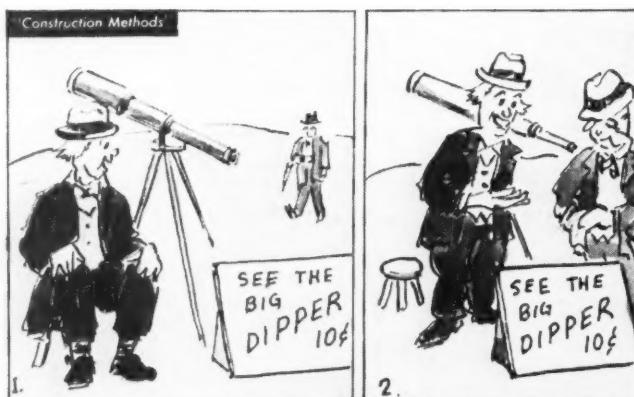
It sounds good to me and it's proved even better. That Oliver "Cletrac" dealer sure has a lot of ideas that make a job easier. He's a good man to know.

• • •

**Cletrac**  
a product of  
**The OLIVER Corporation**  
Industrial Division: 19300 Euclid Avenue, Cleveland 17, Ohio



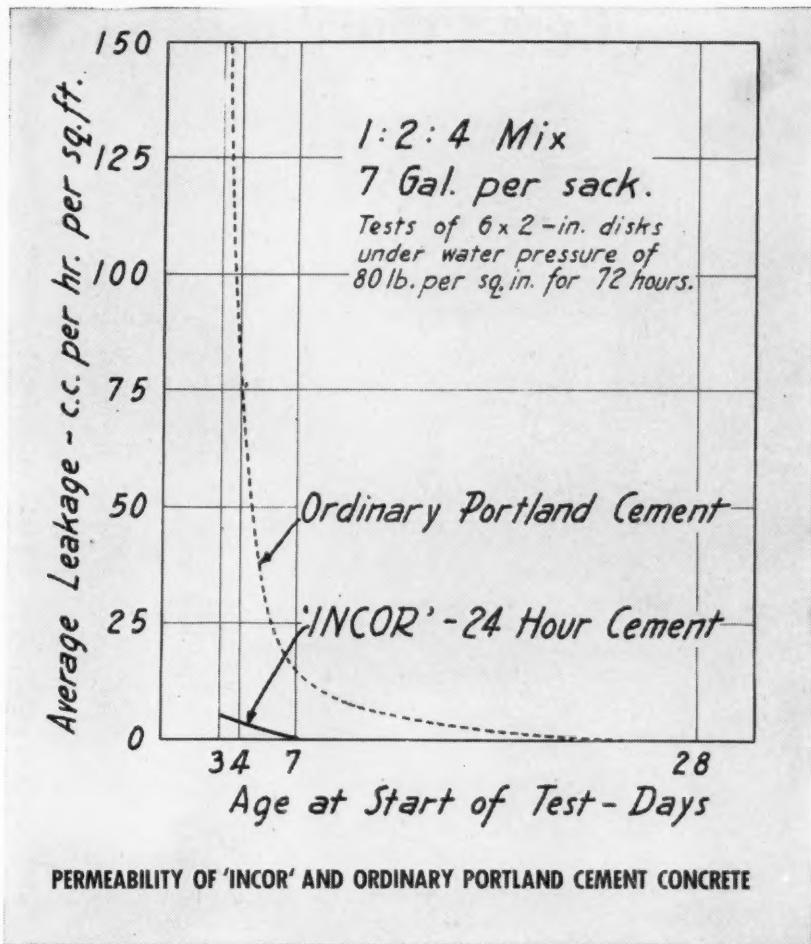
"Sorry, you're a bit too early."



"You'll find she's plenty fast."

"WHEN IT'S 'INCOR' IT'S -

# Watertight™



GOOD concrete is watertight, of itself and by itself. Use a well-designed mix, place carefully, CURE THOROUGHLY. With ordinary cement, thorough curing means keeping concrete wet a week or longer . . . next to impossible on most jobs. 'INCOR' 24-HOUR CEMENT solves this problem, by curing THOROUGHLY in 24-48 hours instead of 6-8 days. Tests in Lone Star Cement Research Laboratory, summarized in graph, show practically no leakage with 3-day-old 'Incor' concrete . . . ten days to equal this with ordinary cement.

"When it's 'Incor'\*, it's watertight" — 20 years' performance in swimming pools, tanks, water works and other structures, proves it! Use America's FIRST high early strength Portland Cement — get added assurance of watertightness and durability —cut curing time and costs. \*Reg. U. S. Pat. Off.

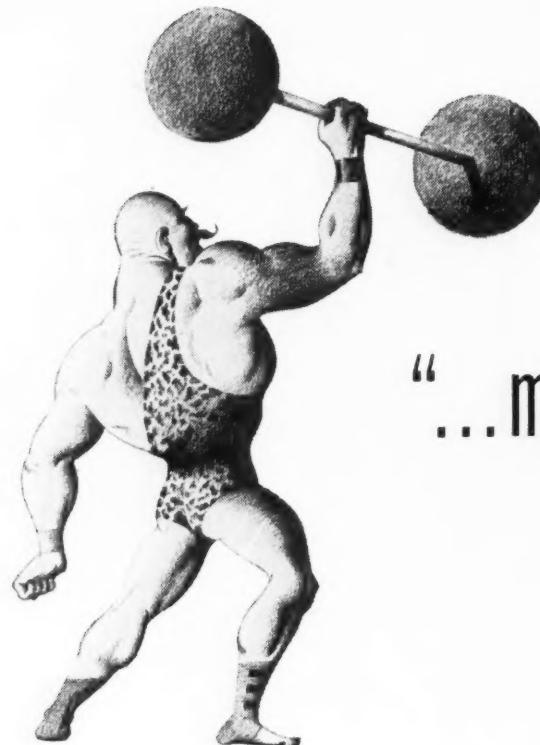
(Below) Water Purification Plant, Albany, Mo., concreted with 'Incor'. Contractor, Don Pray, Monett, Mo.; Engineers, E. T. Archer & Co., Kansas City, Mo.



## LONE STAR CEMENT CORPORATION

Offices: ALBANY • BETHLEHEM, PA. • BIRMINGHAM • BOSTON • CHICAGO • DALLAS • HOUSTON • INDIANAPOLIS • JACKSON, MISS. KANSAS CITY, MO. • NEW ORLEANS • NEW YORK • NORFOLK • PHILADELPHIA • ST. LOUIS • WASHINGTON, D. C.

LONE STAR CEMENT, WITH ITS SUBSIDIARIES, IS ONE OF THE WORLD'S LARGEST CEMENT PRODUCERS: 15 MODERN MILLS, 25,500,000 BARRELS ANNUAL CAPACITY



"...might get a man down..."

**Y**OU order Cumberland Cement by the barrel, but you'd get the surprise of your life if we actually delivered it that way. You expect your cement in 94-pound sacks . . . or, sometimes, in bulk.

As cement containers, barrels went out with bustles and mustache cups. Manufacturers found that by switching to sacks they could save everybody a lot of time, space and expense.

There's another reason, too, why bags are better. The old-time barrel of cement tipped the scales at 376 pounds plus the weight of the barrel. Unless you're an advanced student in a muscle-building course, you'll agree that such a load might get a man down.

*Cumberland*

PORLAND  
CEMENT  
COMPANY

CHATTANOOGA BANK BUILDING  
CHATTANOOGA 2 \* TENN.



PORLAND - HIGH EARLY STRENGTH - AIR ENTRAINING - MASONRY



• Canton Dam, a U. S. Bureau of Reclamation flood control and irrigation project in Oklahoma, will be 14,300 ft. long, containing about 5,300,000 cu. yds. of rolled earth-fill.

Prior to suspension of work during the war, a large fleet of Bottom-Dump Euclids was used by T. L. James & Co. and Williams Bros. When work was resumed in 1946 by C. F. Lytle Co. and Amis Construction Co., Euclid equipment again was selected for this big dirt moving job.

During peak operations more than 20,000 cu. yds. of material a day were placed on the fill by a fleet of 20 Bottom-Dump and 5 Rear-Dump Euclids. Material ranging from blow sand to hard red clay was loaded by two 2½ yd. shovels, two 1½ yd. draglines and a Euclid Loader. Hauls varied from 3,300 to 8,000 feet in length.

Reliable performance and the ability of the Euclids to stay on the job day after day, working two ten-hour shifts much of the time, enabled the contractors to keep well ahead of their earth moving schedule. Your Euclid Distributor or Representative will be glad to show you why Euclid off-the-highway equipment is the choice of many leading contractors and industrial users.

## LYTLE-AMIS USE 25 "EUCES" ON CANTON DAM



A Euclid Loader working with Bottom-Dumps averaged 525 cu. yds. hourly production despite delays caused by lack of sufficient hauling units.



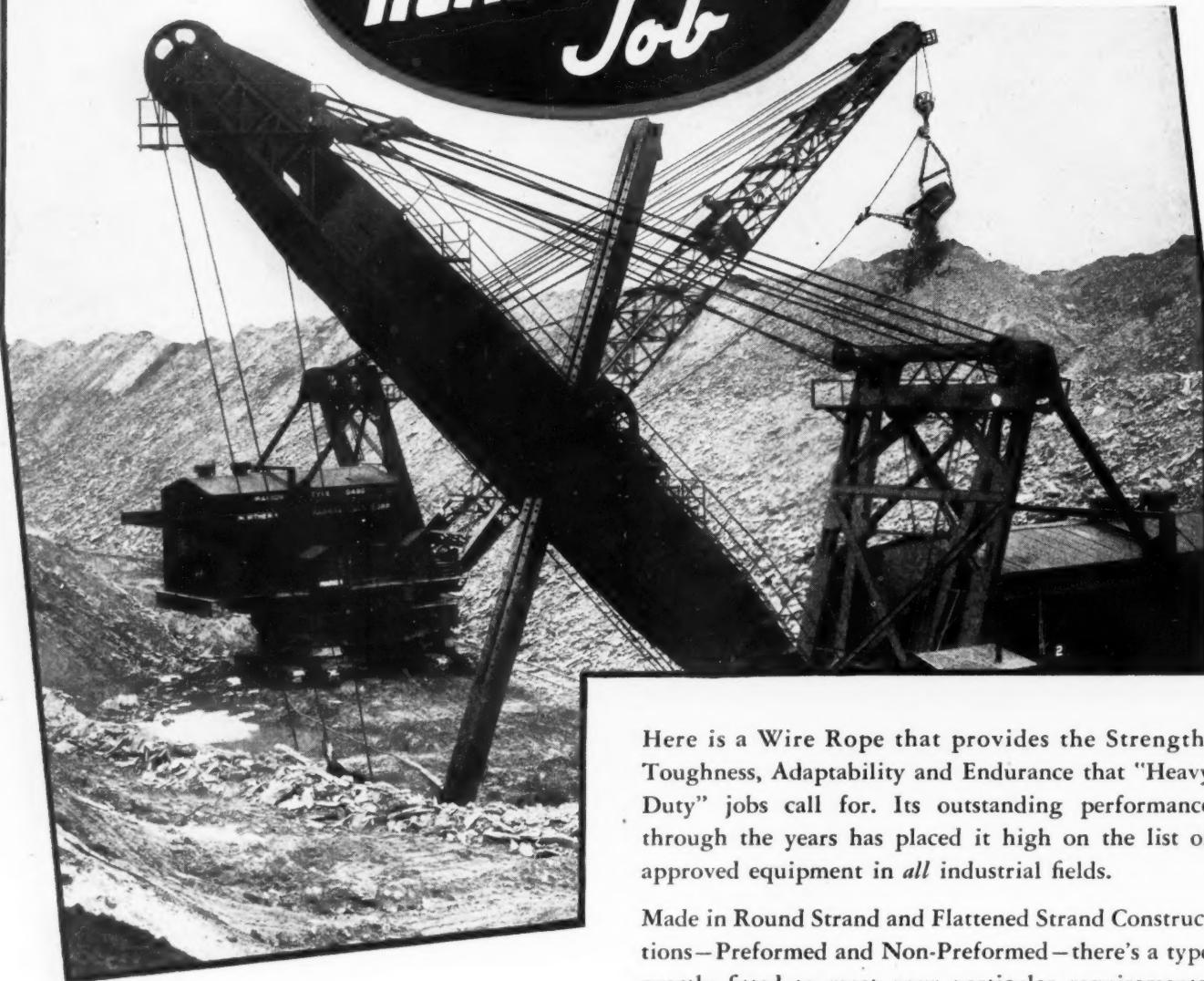
The EUCLID ROAD MACHINERY Co., Cleveland 17, Ohio

# EUCLIDS



*For that*  
**HEAVY DUTY**  
*Job*

The Durability of "HERCULES" (Red-Strand) Wire Rope is a big factor in speeding up production, and consequently reduces operating costs.



Here is a Wire Rope that provides the Strength, Toughness, Adaptability and Endurance that "Heavy Duty" jobs call for. Its outstanding performance through the years has placed it high on the list of approved equipment in all industrial fields.

Made in Round Strand and Flattened Strand Constructions—Preformed and Non-Preformed—there's a type exactly fitted to meet your particular requirements.

Your inquiries are invited!

# "HERCULES"

REG. U.S. PAT. OFF.

**RED-STRAND**  
**WIRE ROPE**

MADE ONLY BY

**A. LESCHEN & SONS ROPE CO.**

ESTABLISHED 1857

5909 KENNERLY AVENUE • ST. LOUIS 12, MISSOURI  
NEW YORK • CHICAGO • DENVER • SAN FRANCISCO • PORTLAND • SEATTLE

*A development of*  
**B.F. Goodrich**  
**FIRST IN RUBBER**



## Double shock shields made of nylon now give you more for your tire dollar

USERS of the B. F. Goodrich Universal (shown above) and other B. F. Goodrich off-the-road tires have long reported greater savings because of shock shield construction—B. F. Goodrich's answer to the problem of impact bruises when tires strike rocks, ruts, timbers, etc.

Now, shock shields . . . made of nylon . . . are used in all large B. F. Goodrich off-the-road tires. These double nylon shock shields consist of four layers of nylon cords between the tread and the plies. The nylon layers are in pairs—cords in each pair running at scientifically determined angles with those in the other pair to give "balanced" strength.

The strong, elastic nylon cords in

each layer run parallel, fully insulated in live rubber. Under impact the cords in the shields stretch together, not across each other, and return to their original position. Because of this principle, impacts are distributed, absorbed . . . the rayon cord body is actually shielded from shock!

No make of tire other than B. F. Goodrich gives you the added protection of the *double nylon shock shield* . . . the additional saving through: (1) longer tire life; (2) increased number of recappable tires; (3) increased bruise resistance; and (4) less danger of tread separation.

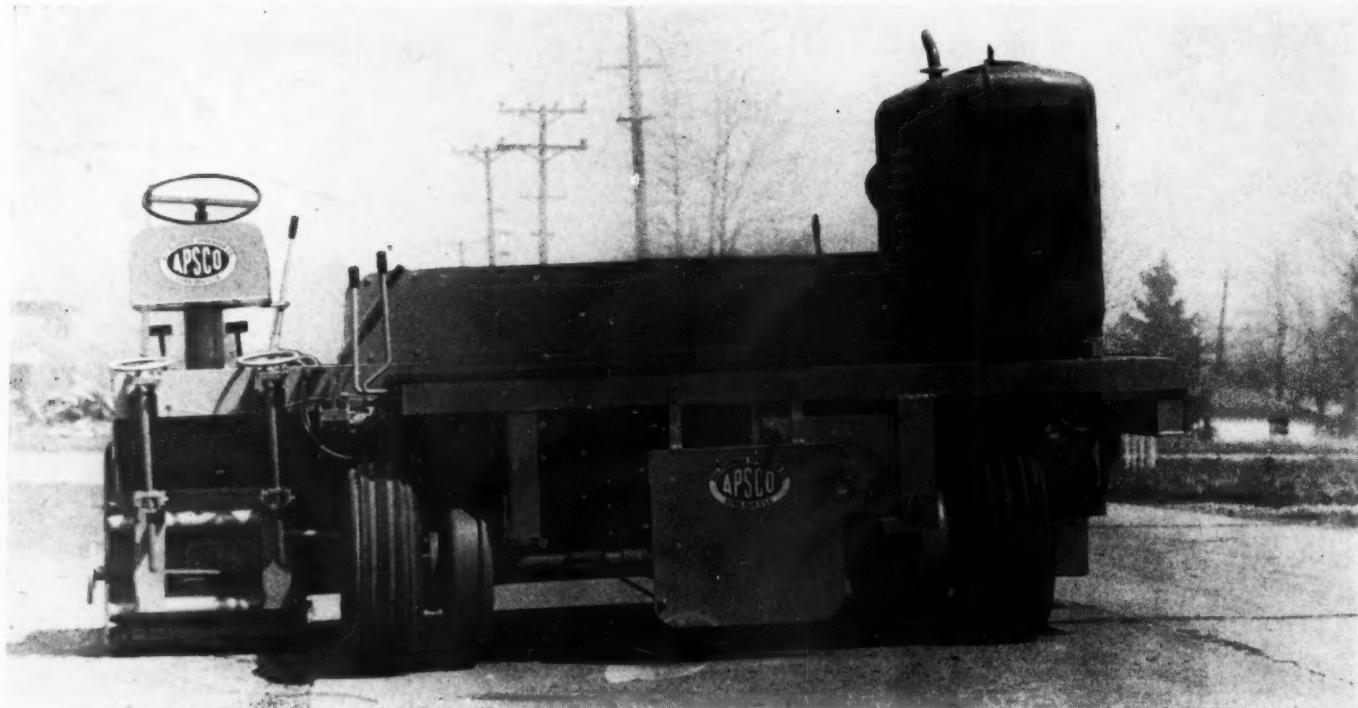
Too, there are extra advantages with B. F. Goodrich Universal Silvertowns. The tread is non-directional. Spares

can be mounted on any wheel position. The Universal's tread has thick, heavy lugs that protect the undertread. And the tread is designed so that the natural running action pushes mud and dirt toward the edges. The tire stays clean; gives excellent traction in either direction and resists side slippage.

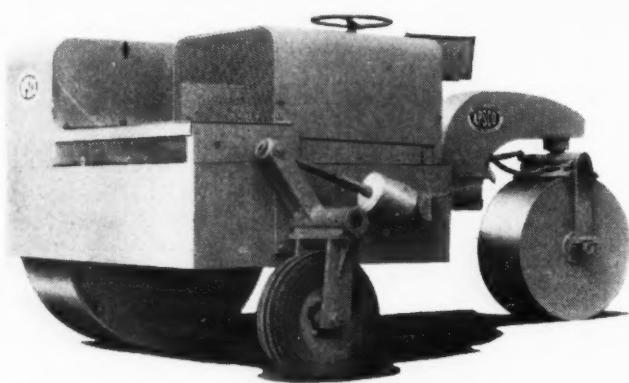
Find out how B. F. Goodrich can help you solve your tire problems. See the B. F. Goodrich dealer or write us direct. *The B. F. Goodrich Company, Akron, Ohio.*

*Truck Tires*  
BY  
**B. F. Goodrich**

# Widens Roads Better—Faster—at Lower Cost



## APSCO Model 60 ROAD WIDENER



### APSCO Trench Roller

The model TR-18 Trench Roller is the latest addition to the APSCO road widening line. It features a pneumatic tired leveling wheel with powered screw-type leveling unit for adjustment. Elasticity of pneumatic tire prevents roller from damaging forms when leveling wheel hits an obstruction. Automotive type steering gives greater maneuverability allowing 45° turning radius. Roller has two speeds forward and reverse. Front roll is 15" wide—rear roll 18" wide. Write for complete specifications.

● The APSCO Road Widener provides a better—faster—more economical method of road widening or shoulder building.

This machine offers road contractors, states, counties and cities a practical, time and labor saving means of handling road widening operations.

The machine handles all types of material from 2" on down, including hot or cold bituminous mix, sand, gravel, stone, slag, dirt, etc. Standard unit handles spread widths from 2 to 4 feet. Other widths available—depth unlimited. Machine handles 125 tons per hour.

Easy to handle—Machine operator and helper all the crew required. Truck driver merely raises dump body and keeps slight tension on truck brakes. Machine operator controls widening machine from here on.

Accurate—machine leaves straight edge—no road forms required—no raking nor carrying back necessary.

For full details of construction and operation—write for specification sheet APSCO Model 60.

**THE ALL-PURPOSE SPREADER CO.**  
FULLER ROAD . . . ELYRIA, OHIO

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ur best ADVERTISEMENTS



... are in the field  
making money  
for their owners!

Northwest owners believe in Northwest equipment when they buy it. When they weigh its performance on the job against that of other equipment that they have owned—When they learn of its low-cost operation and high output first hand—When they find their confidence more than repaid, they become part of the long line of Northwest repeat order owners that purchase one out of every three Northwests.

Northwest's best advertisements are the Northwest Machines in the field making money for their owners.

NORTHWEST ENGINEERING COMPANY  
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# NORTHWEST

SHOVELS • CRANES • DRAGLINES • PULLSHOVELS



# MORE PRODUCTION -



MODEL  
50-A

THE NEW "MULTIPLEX" 50A is especially designed to handle heavier work in greater capacities -- and to do it faster, more accurately and with greater ease of operation.

Lumber yards, general contractors and industrial users will find this new streamlined MULTIPLEX the most versatile performer of any radial arm saw.

- Left Hand Miters -- in the same 100% range as right hand miters.
- Exclusive Versatile Elbow or center suspended track means unlimited saw positions.
- Movable Table provides for greater capacity cuts -- permits full usable travel of the cutting head in any cross cut, miter or rip position.
- Ball Bearing Assembly -- has self cleaning balls running on nitr alloy rods for ease of cutter head operation.
- Automatic Recording Rip Scales -- provide an accurate and convenient means of measuring width of rip.

For greater production and operating economy investigate this New "MULTIPLEX."

Write for full information and name of nearest dealer.

RED STAR PRODUCTS • INC.  
3455 VEGA AVENUE, CLEVELAND, OHIO, U. S. A.

**MULTIPLEX**  
*Radial-Arm Saws*

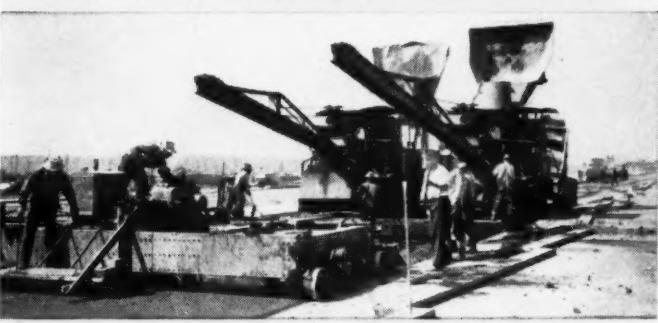
## JAEGER EQUIPS YOU for modern paving work



Julius Porath & Sons Co., Detroit, laying super-elevated curve of 35° maximum slope with ingenious strike-off mounted on Jaeger Finisher.

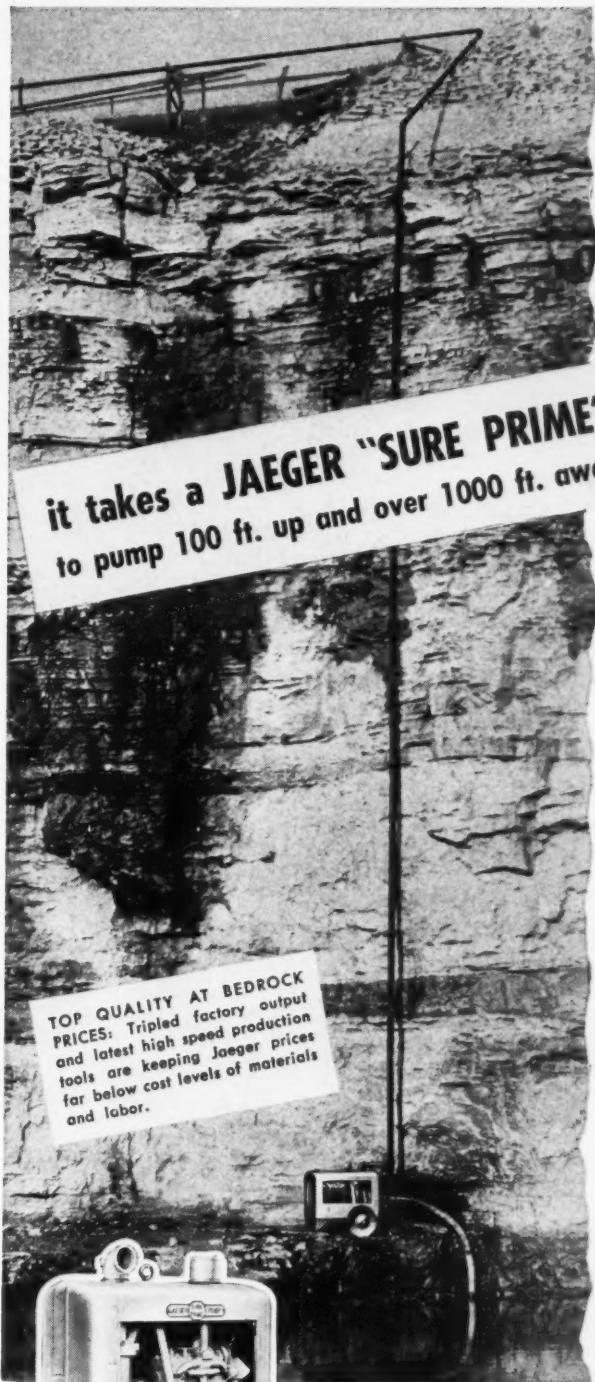


Jaeger Screw Spreader remixing as it places stiff material.



Jaeger High Speed Finisher sets fast pace for two big pavers.

When you buy paving equipment today, make sure it will equip you to meet the problems that are coming — entirely different specifications, new designs of pavements and paving materials presenting problems of remixing, of internal deep vibration, of laying new contours, of finishing new types of concrete — and always the problem of keeping your job costs below your estimates. Your Jaeger distributor knows the most modern paving machinery and its possibilities. Talk it over with him. You'll be ahead.



TOP QUALITY AT BEDROCK PRICES: Tripled factory output and latest high speed production tools are keeping Jaeger prices far below cost levels of materials and labor.



Model 4P

After 2 other well-known pumps tried it and failed, a standard Jaeger 4" Pump successfully handled this tough pumping job at Westlake Quarry, St. Louis, Mo. Remember this when you buy pumps: Jaeger "Sure Primes" are built and powered far beyond ordinary standards and kept efficient by weather-proof enclosures which no other pumps provide. Sizes 1½" to 10".

## THE JAEGER MACHINE COMPANY

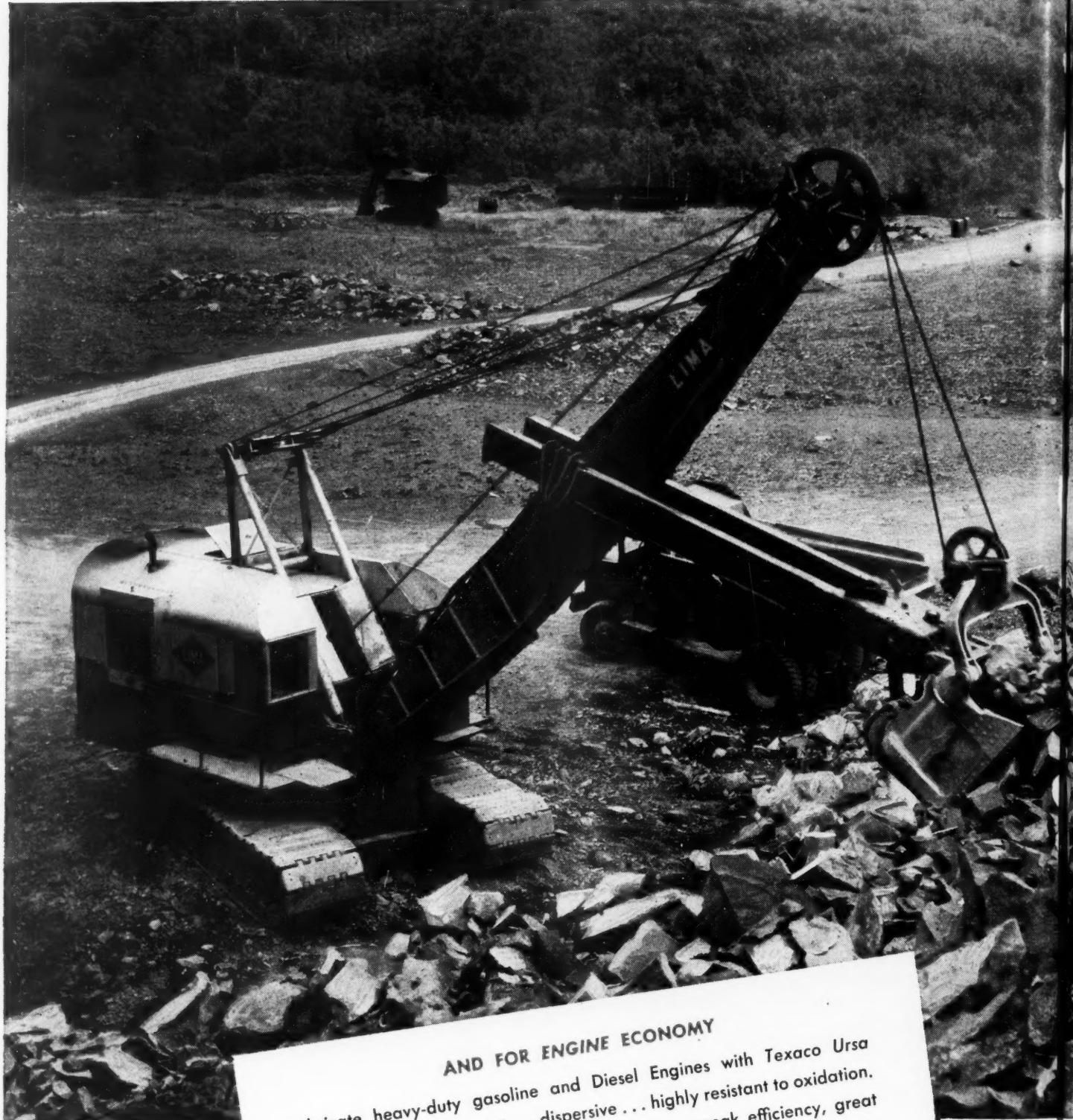
800 Dublin Avenue, Columbus 16, Ohio — Distributors in 120 Cities

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AND FOR ENGINE ECONOMY

Lubricate heavy-duty gasoline and Diesel Engines with Texaco Ursa Oil X★. It's fully detergent... dispersive... highly resistant to oxidation. Ursa Oil X★ keeps engines clean... assuring peak efficiency, great fuel economy, and savings all along the line on maintenance and repairs.

Tune in . . .  
TEXACO STAR THEATRE  
presents the NEW  
TONY MARTIN SHOW  
every Sunday night.  
See newspaper for time  
and station.



# TEXACO

# THE LUBRICANT THAT

Cuts your  
maintenance  
costs



Nothing beats *Texaco Marfak* for "lubricating persistency". It's tough — holds together — and stays in bearings despite the squeeze of heavy loads and the pounding of rough service. *Marfak* also prevents dirt and moisture from getting in — gives longer-lasting protection that cuts maintenance costs.

In wheel bearings, use *Texaco Marfak Heavy Duty*. Its long lasting protection comes from its unique ability to provide a fluid lubricating film inside the bearing while retaining its original consistency at the outer edges — thus sealing itself in, sealing out dirt and moisture.

*More than 250 million pounds of Marfak have been used to date!* You couldn't ask for better proof of quality and performance.

Contractors everywhere gain many time- and money-saving advantages by using the Texaco Simplified Lubrication Plan. Ask about it. Call the nearest of the more than 2500 Texaco distributing plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

## Lubricants and Fuels FOR ALL CONTRACTORS' EQUIPMENT

# FORWARD 15 m.p.h.

four  
speeds



# TOURNADOZER.

PRODUCTION TABLE — PUSHER LOADING

Haul One-way	Tournapulls served	Haul One-way	Tournapulls served
300'	2	5,000'	7
1,000'	3	6,000'	8
2,000'	4	7,000'	9
3,000'	5	8,000'	10
4,000'	6	10,000'	13

PRODUCTION TABLE — DIRTMOVING

Haul	Yards in 1 Hour	Yards in 8 Hours
50'	184	1472
100'	118	944
200'	66	528
300'	46	368
400'	35	280

Above production based on good working conditions, negligible grades, level cuts, efficient management and 60-minute-per-hour operating efficiency.



See your Le Tourneau Distributor  
NOW for complete information

# REVERSE 15 m.p.h. four speeds

Dozer travel is 50% forward, 50% reverse, so the revolutionary new four-wheel-drive Tournadozer gives you approximately double the fastest crawler's forward speed and full range of **FORWARD SPEEDS IN REVERSE**.

Dozer work involves lots of shifting, so the high-speed Tournadozer has constant-mesh Tournamatic transmission . . . gives you instantaneous change of gear ratios forward or reverse, any time . . . any place. Just move lever to any gear selection you want and you're in it and **ON YOUR WAY . . . RIGHT NOW.**

Dozer duty is hard on tracks, so the new Tournadozer rolls on rubber . . . big tough tires 21.00 x 25. That cuts out a lot of track repair delays and materially **CUTS MAINTENANCE EXPENSE.**

Dozer jobs often get into soft going, so the big Tournadozer tires have tapered beads. That means low tire pressure . . . extra flotation . . . and lets you use extra low pressure to get **PLENTY OF TRACTION IN SAND AND MUCK.**

Dozer work has always been tough on the operator . . . Tournadozer operators ride easy on low pressure pneumatic tires . . . sit easy on hydraulic suspension seat . . . take it easy because air-actuated finger-tip controls **TAKE LABOR OUT OF OPERATING.**

Dozer travel often involved slow on-job moves and expensive haul from job to job. But the new Tournadozer goes anywhere on the job or **DRIVES JOB-TO-JOB FAST . . . AT 15 MPH.**

Check your LeTourneau Distributor for delivery. Order NOW.

## 4 wheel drive on rubber



Just move the selector lever to the speed you want and the air clutches give it to you instantly.



4-wheel drive plus big, low-pressure tires give plenty of traction and flotation to move big loads of abrasive, loose sand.

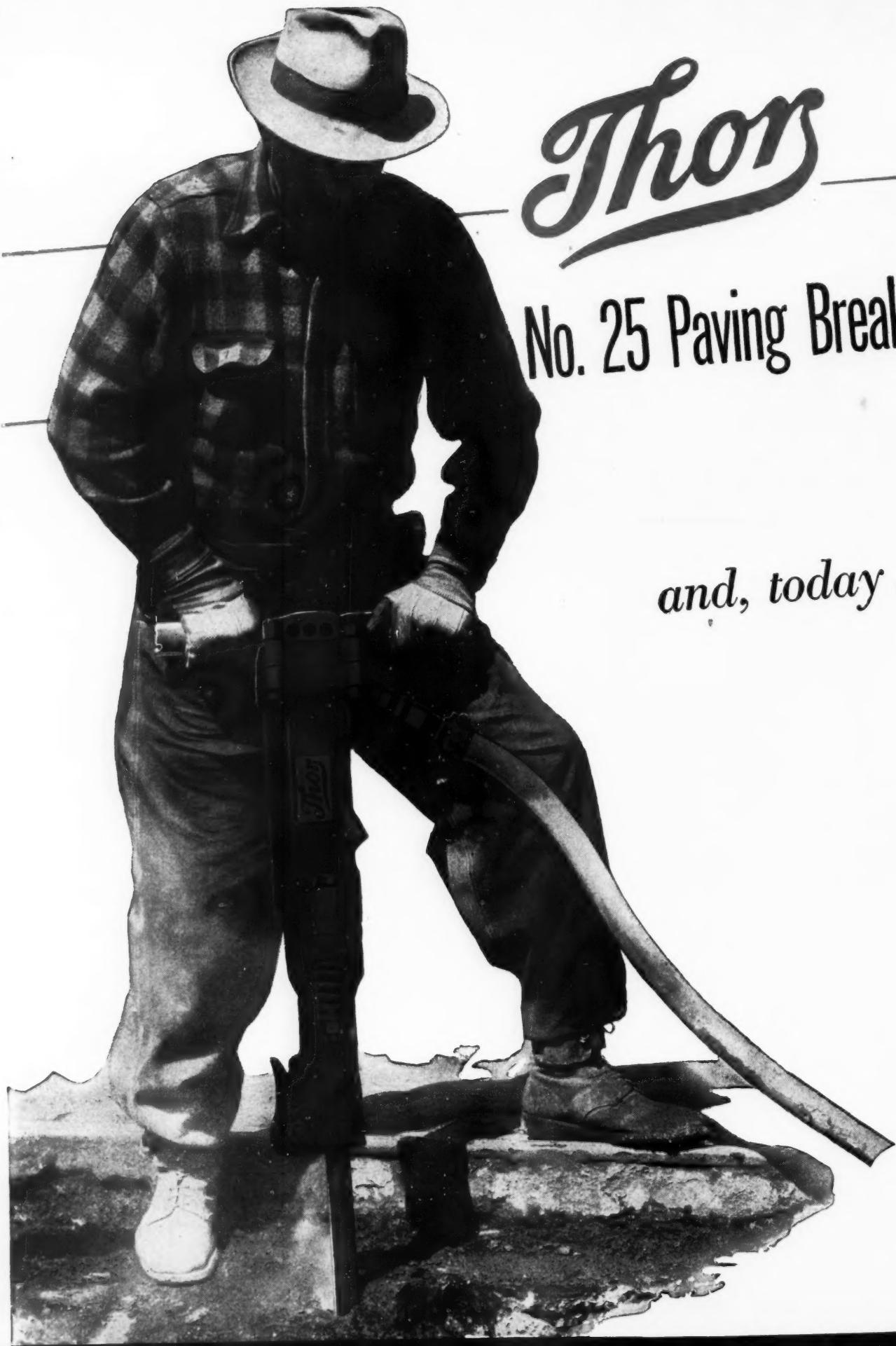
**LETOURNEAU**  
PEORIA, ILLINOIS



## TOURNADOZERS

FIRST MACHINE DESIGNED FOR DOZING AND PUSHING

Tournadozer, Tournamatic — Trade Mark Reg. U.S. Pat. Off. Cat.



*Thor*

No. 25 Paving Breaker

*and, today . . .*

...best in basic design  
....for 10 years the leader in performance  
....STILL CHAMPION!

Performance . . . performance on more and more jobs the past 10 years . . . has proved the Thor 25 Paving Breaker has no equal!

The hardest hitting paving breaker . . . with amazing air economy . . . longer service life. These features the industry demanded 10 years ago. Then, Thor had the answer in a basic design . . . and instantly had the champion.

*Today, Thor still has the champion!*

The Thor 25 has more than proved performance behind it. It has the quality of experience gained only by widest application as the leader . . . experience that has brought continued improvements to its basic design.

Today, accept any challenge . . . test the champion for proof. Call a Thor dealer for a demonstration.

**INDEPENDENT PNEUMATIC TOOL COMPANY**

600 West Jackson Boulevard, Chicago 6, Illinois

Export Division: 330 West 42nd Street, New York 18, New York

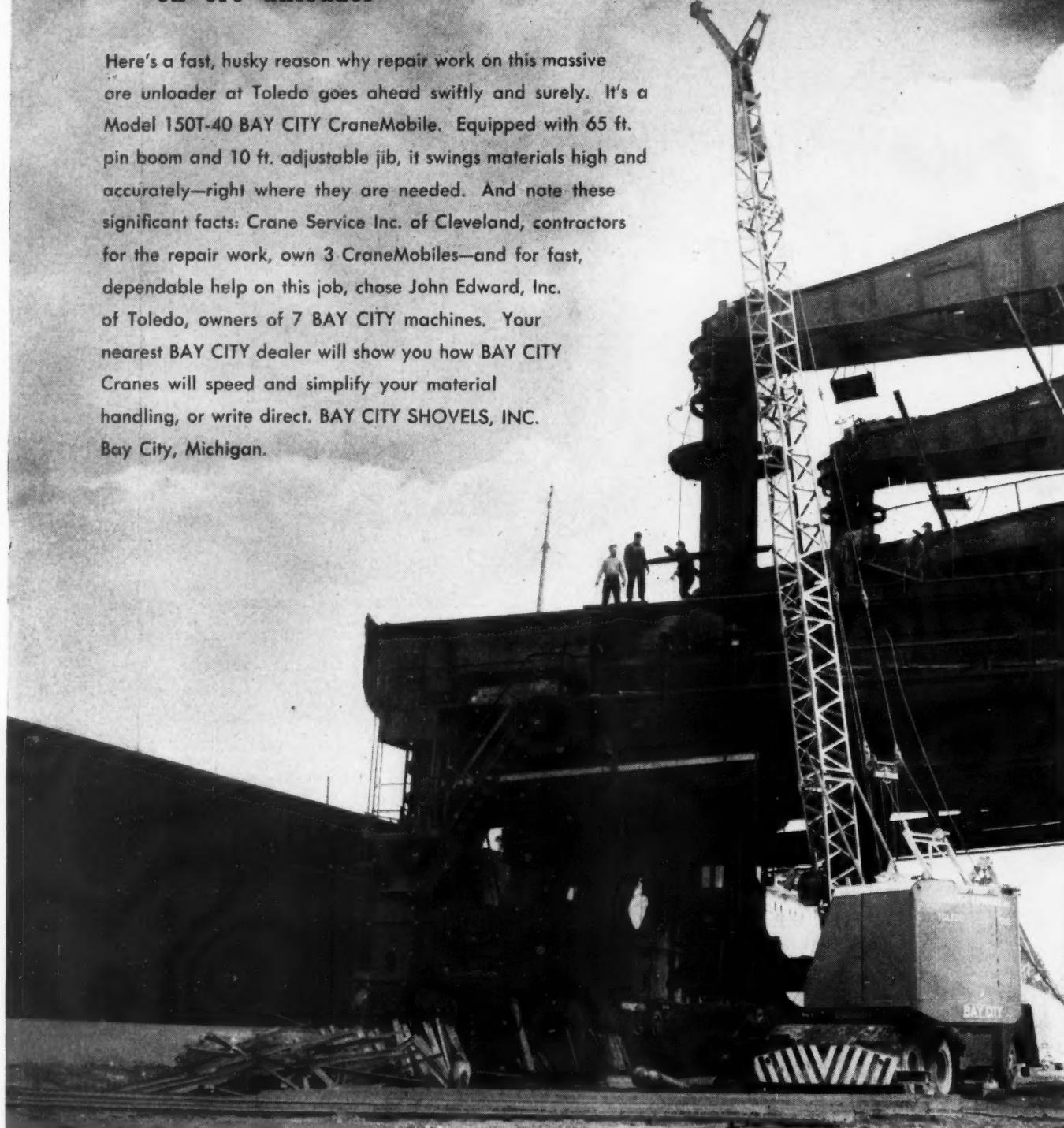
Birmingham	Boston	Buffalo	Cincinnati	Cleveland	Denver	Detroit
Houston	Los Angeles	Milwaukee	New York	Philadelphia	Pittsburgh	
St. Louis	St. Paul	Salt Lake City	San Francisco	Toronto, Canada	Sao Paulo, Brazil	London, England



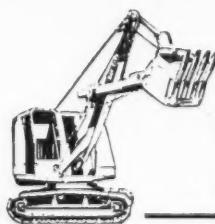
PNEUMATIC TOOLS • UNIVERSAL AND HIGH FREQUENCY ELECTRIC TOOLS • MINING AND CONTRACTORS TOOLS

## BAY CITY CRANE MOBILE speeds repair work on ore unloader

Here's a fast, husky reason why repair work on this massive ore unloader at Toledo goes ahead swiftly and surely. It's a Model 150T-40 BAY CITY CraneMobile. Equipped with 65 ft. pin boom and 10 ft. adjustable jib, it swings materials high and accurately—right where they are needed. And note these significant facts: Crane Service Inc. of Cleveland, contractors for the repair work, own 3 CraneMobiles—and for fast, dependable help on this job, chose John Edward, Inc. of Toledo, owners of 7 BAY CITY machines. Your nearest BAY CITY dealer will show you how BAY CITY Cranes will speed and simplify your material handling, or write direct. BAY CITY SHOVELS, INC. Bay City, Michigan.



# BAY CITY



SHOVELS • DRAGLINES  
CRANES • HOES • CLAMSHELLS

SEE YOUR NEAREST DEALER for Bay City excavating and material handling equipment in sizes from  $\frac{3}{8}$  to  $1\frac{1}{4}$  yards having crane rating up to 20 tons. Both crawler and pneumatic tire mounting.

*This Emblem*



*Identifies  
Great Trucks*



# BACK OF THE TRUCK - THESE 3

**International  
TRUCK SERVICE**

**International  
ENGINEERED PARTS**

**International  
APPROVED ACCESSORIES**

Rugged stamina! Long mileage! Economy of operation!

International Trucks provide all three in such abundance that for 16 years more heavy-duty International Trucks have served American commerce and industry than any other make.

And to make sure that every operator gets every profitable mile and every available economy from every International Truck, this is the *Three-Part Service* International provides:

#### MAINTENANCE AND SERVICE

Quickly available everywhere from thousands of International Dealers and the nation's largest company-owned truck-service organization — International Branches.

#### ENGINEERED PARTS

Precision-made, like the originals in International Trucks — wear better and last longer.

#### APPROVED TRUCK ACCESSORIES

A complete line for every truck need.

Triple-checked against the most rigid standards to assure efficient, trouble-free performance.

Yes, International *Three-Part Service* makes sure that operators get the extra mileage, the dependable stamina and the low operating cost built into all International Trucks.

Motor Truck Division  
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**40<sup>TH</sup> ANNIVERSARY OF INTERNATIONAL TRUCKS**  
1907-1947—Forty years of International Truck Service to Industry, Commerce, Agriculture

Tune in James Melton on "Harvest of Stars" Sunday! NBC Network.

**INTERNATIONAL Trucks**



# NO OTHER AT ANY

can match the profit-  
a modern **LAPLANT**.



LaPlant-Choate scrapers are the only job-proved, completely modern, postwar models with all these profit-making features: 25% easier loading — lower horsepower requirements — faster, cleaner, smoother spreading — positive forced ejection — open bowl — no useless dead weight — low center of gravity — modern, high strength alloy steel — modern, high natural rubber content tires — sturdy construction — low maintenance cost and high trade-in value. As the result, operating records on hundreds of tough earthmoving jobs, working in all kinds of tough earthmoving jobs, LaPlant-Choate scrapers outperform other leading scrapers by wide margins.

Now, look what this performance means in dollars and cents. Even if you were able to obtain other scrapers at half price, within six months

you would have been way ahead by buying a new LPC scraper. Within a year, you would be better off even if you got the other as a gift. Then, for thousands of hours, your profits will roll in still faster.

Any way you look at it, no matter what kind of scrapers you are using now, you'll be money ahead by replacing them with modern, job-proved LaPlant-Choate units. Another advantage, too, is the fact that LPC scrapers in most sizes (from 2 to 14 yd. struck measure) are ready for immediate delivery. Your nearest LPC distributor can tell you how hundreds of contractors are using "higher income" LaPlant-Choate scrapers to bid lower and still make profits. LaPlant-Choate Manufacturing Co., Inc., Cedar Rapids, Iowa; 1022 77th Ave., Oakland, Calif.

**LaPLANT CHOATE**  
*Positive FORCED EJECTION SCRAPERS*

FIRST in Value because they're  
FIRST in Performance!

# SCRAPER- PRICE

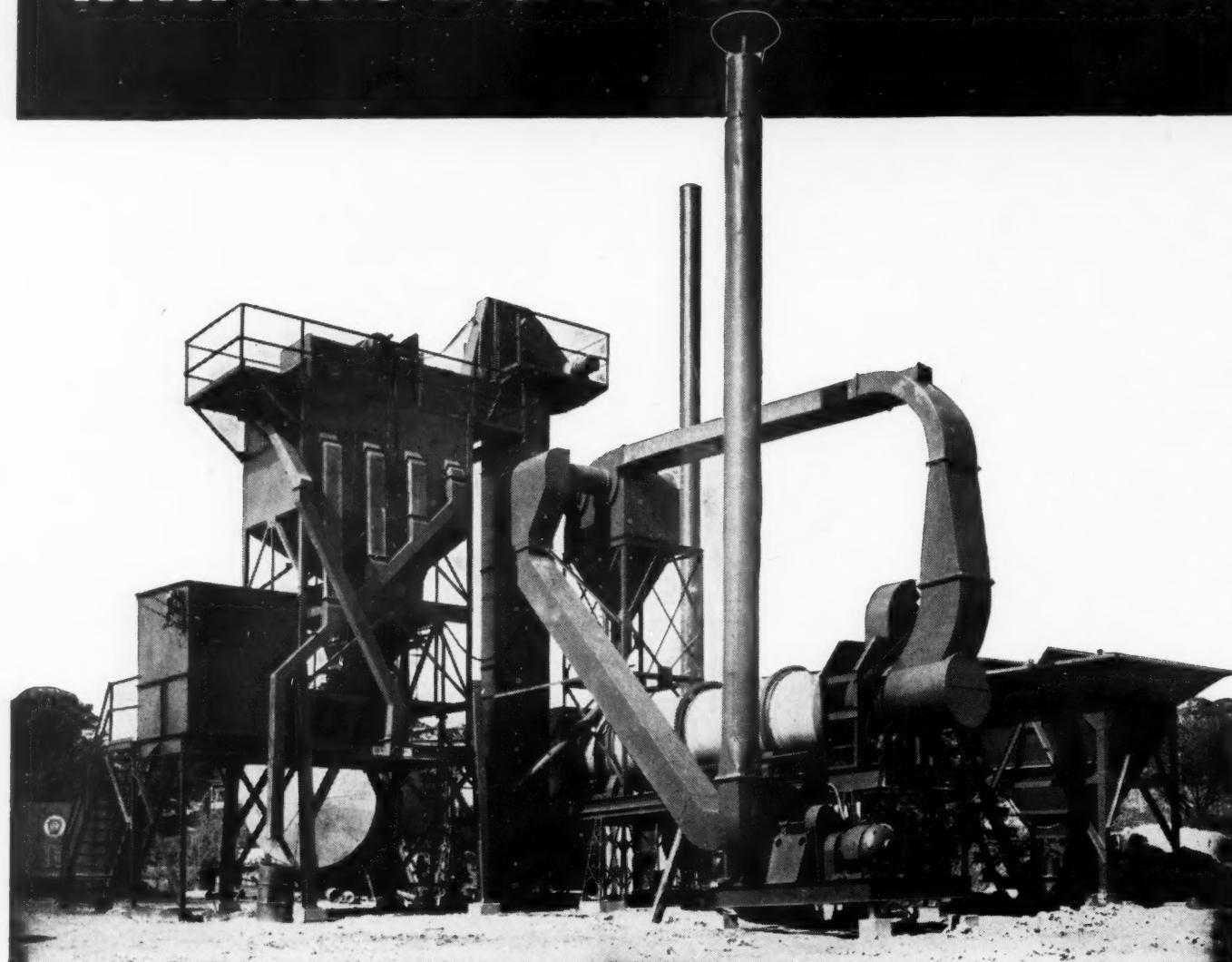
**earning capacity of  
CHOATE scraper!**

**LOOK HOW MUCH MORE MONEY YOU CAN MAKE WITH  
MODERN LaPLANT-CHOATE SCRAPERS!**

Scraper	LaPlant-Choate C-108 (Struck 8.4 yds.)	A (Struck 8.2 yds.)	B (Struck 8.7 yds.)	C (Struck 8 yds.)	D (Struck 8.5 yds.)
Average No. of yards moved Per Hour at 800 ft. One-way haul—50 min. hr.	74	63*	65*	64**	61***
Estimated Earning Capacity per hour based on average 800' haul and return, at 25 cents per yard.	\$18.50	\$15.75*	\$16.25*	\$16.00*	\$15.25*
Estimated Earning Capacity based on average haul of 800' and return, at 25 cents per yard for . . .					
1000 Hrs.	\$ 18,500	\$ 15,750	\$ 16,250	\$ 16,000	\$ 15,250
3000 Hrs.	55,500	47,250	48,750	48,000	45,750
5000 Hrs.	92,500	78,750	81,250	80,000	76,250
7000 Hrs.	129,500	110,250	113,750	112,000	106,750
9000 Hrs.	166,500	141,750	146,250	144,000	137,250
11000 Hrs.	203,500	173,250	178,750	176,000	167,750
13000 Hrs.	240,500	204,750	211,250	208,000	198,250
15000 Hrs.	277,000	236,250	243,750	240,000	228,750

\*Manufacturer's own figures \*\*Estimated \*\*\*Government tests

# 74 TONS OF HOT MIX PER HOUR WITH THIS H & B PORTABLE PLANT



The Hetherington & Berner portable asphalt plant pictured above, recently installed by the West Virginia Black Rock Co., of Charleston, W. Va., has averaged better than 74 tons of hot mix per hour. This is a PA-20 plant, with all-electric drive—wired complete at the H & B factory.

Hetherington & Berner builds two types of portable asphalt plants: Model P-A, designed for the contractor who moves frequently and who must be able to get efficient production on small as well as large

jobs; and Model P-E (electrically driven), recommended especially for contractors who do not ordinarily move more than once or twice a season. Both types are completely portable and incorporate many advanced features of design that insure dependable, economical and uniform production.

New literature describing both of these types of portable plants, H & B stationary plants, and the new H & B Moto-Paver—the complete traveling mixer and paver—will be sent on request.

## MOTO-PAVER The Complete Traveling Mixer and Paver



Here, for the first time, is a self-contained, single unit machine which accomplishes the mixing and laying in one continuous operation. The Moto-Paver delivers the mixed material spread and struck off on the road surface, ready for rolling. Bulletin MP-47, which gives complete information and specifications, sent on request.

**HETHERINGTON & BERNER INC., 735 Kentucky Avenue, Indianapolis 7, Indiana**



**IF THE JOB IS  
IMPORTANT...  
THEY SPECIFY SCHRAMM  
•  
ANY TIME  
•  
ANY WHERE**

Here you see 7 construction jobs being furnished compressed air by Schramm Air Compressors. Every one of the jobs is tough . . . but easily handled by Schramm, who furnishes all the air needed.

Throughout the country you will find Schramm Compressors used in construction work, specified because they are versatile, compact, lightweight. Schramm offers many advanced features. For full details write us today.



**SCHRAMM INC.**  
THE COMPRESSOR PEOPLE  
WEST CHESTER • PENNSYLVANIA

# Barber-Greene

*The Ditcher that Conquered CORAL ROCK!*

Tough abrasive coral rock wasn't considered a good spot for a mechanical ditcher until the B-G Vertical Boom Ditcher first showed how the job could be done. Since that time, miles of trench have been cut in coral rock by B-G Ditchers, from the Florida flat lands to the Pacific's war-won islands. Naturally, with that kind of ability it is the preferred, moderate width, medium depth ditcher for working in everything from cemented gravel to sticky gumbo.

Like all B-G machines, it is engineered by experts

to give long-time, cost-reducing service: the self-cleaning "kick-out" digging buckets on the vertical boom operate like a milling machine for sure cutting action; the automatic overload release gives positive protection, automatically resets itself: its short length, low over-all height and sure-footed crawlers give it maximum maneuverability. These are unique features that recommend this B-G Ditcher for tough going. Barber-Greene Company, Aurora, Illinois.

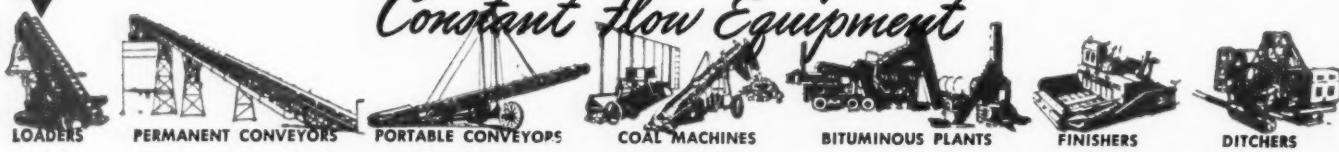


*There's no other like it! No other ditcher can equal the efficient "milling action" of the B-G "vertical boom" Ditcher.*



BARBER-GREENE COMPANY • AURORA, ILLINOIS

*Constant Flow Equipment*



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MACHINERY CO.  
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Milwaukee—NORTHERN ENGINEERING &  
MANUFACTURING CO.

# NOVO NEWS

JUNE, 1947

**EXTRA**

## FLASH! Novo Introduces Mechanized Wheelbarrow!

**SCOOTRUK** Releases 5 to 8 Men  
for Other Work

It carries a full ton of wet concrete . . . or sand . . . or bricks . . . or almost any material! It scoots along at 15 per . . . skims over soft ground . . . climbs steep grades with a full load . . . shoots through four-foot doors . . . turns on a dime in tight places . . . is light enough for scaffold work.

It's the Scootruk—the eye-opening Novo mechanized wheelbarrow which enables one man to do the work of 5 to 8 without back-breaking lifting and hauling.

The Scootruk is a natural for all sorts of construction jobs. In pouring

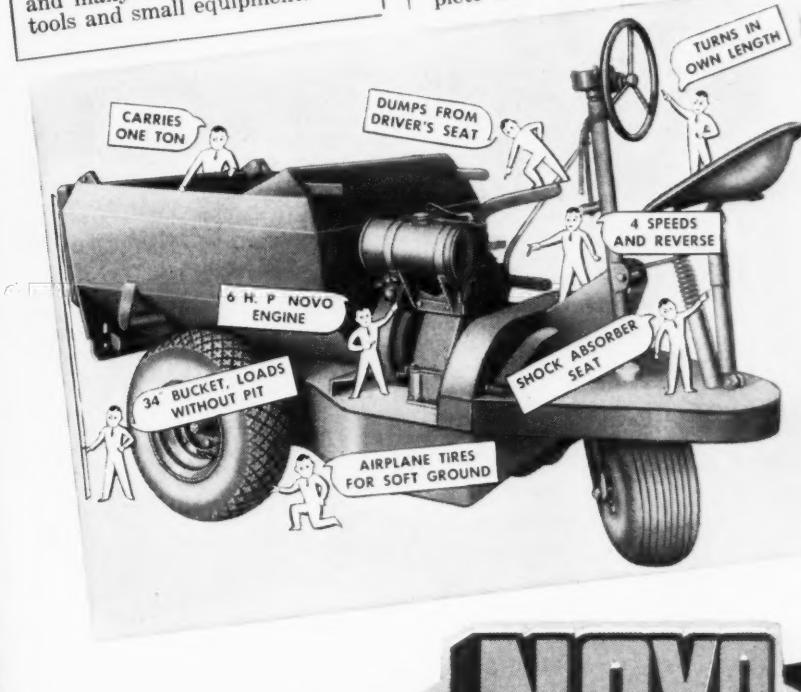
floors and slabs, for example, loading is usually done without a pit or special platform because the bucket is only 34 in. high; dumping is controlled from the driver's seat. Since the Scootruk handles a full ton load on each trip, more mixer loads can be run per day.

The Scootruk is ruggedly built to withstand rough service. It is powered by a 6 horsepower, air-cooled Novo engine and equipped with a heavy duty, 4-speed and reverse transmission.

The Scootruk pays for itself in no time at all. See your nearest Novo distributor or write direct for complete information.

**Many Uses**

You'll find dozens of uses for the Scootruk—transporting concrete, sand, bricks, mortar, blocks, and many other items including tools and small equipment.



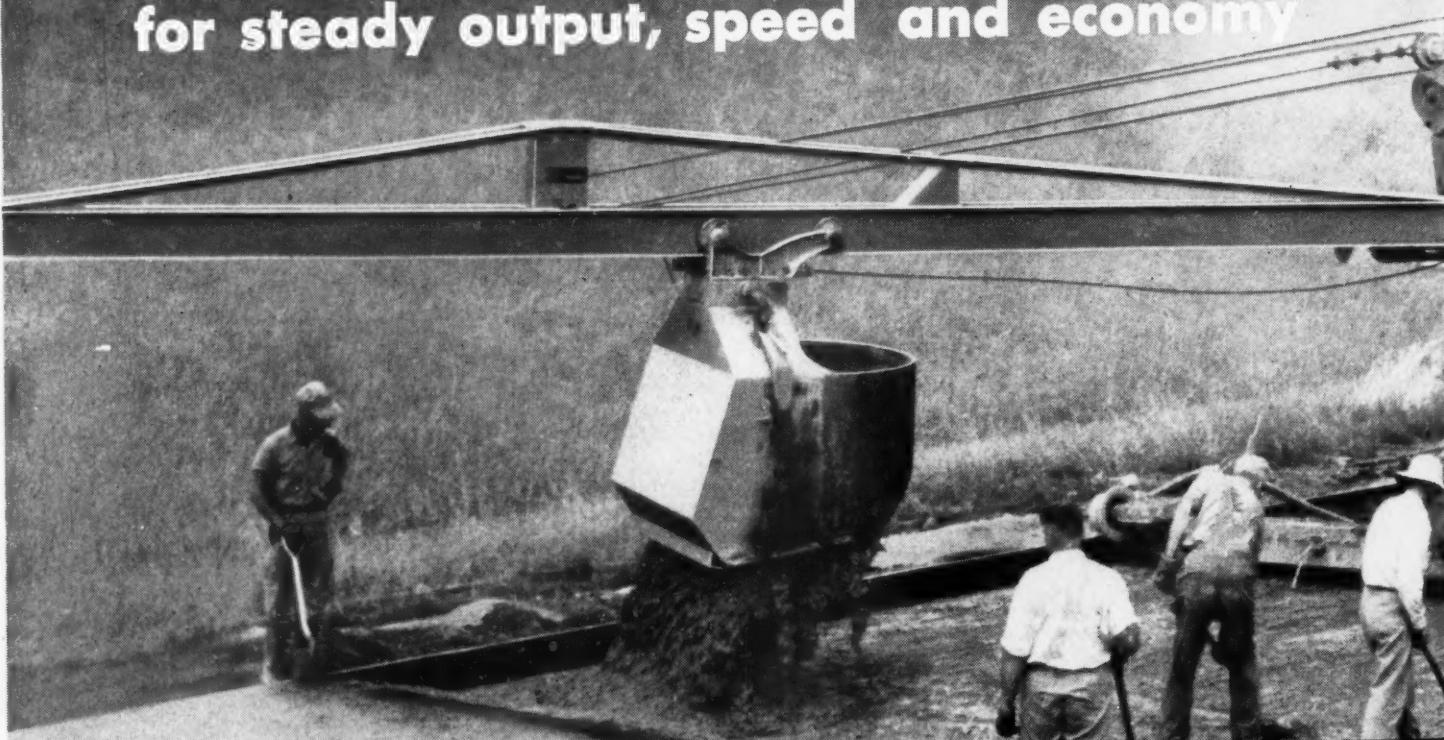
**NOVO**  
ENGINE COMPANY  
LANSING 5, MICH. U.S.A.  
**CONTRACTOR'S EQUIPMENT**  
• GRAY IRON CASTINGS •  
**ENGINES**



*All the way, it's*

# KOEHRING HEAVY-DUTY

for steady output, speed and economy



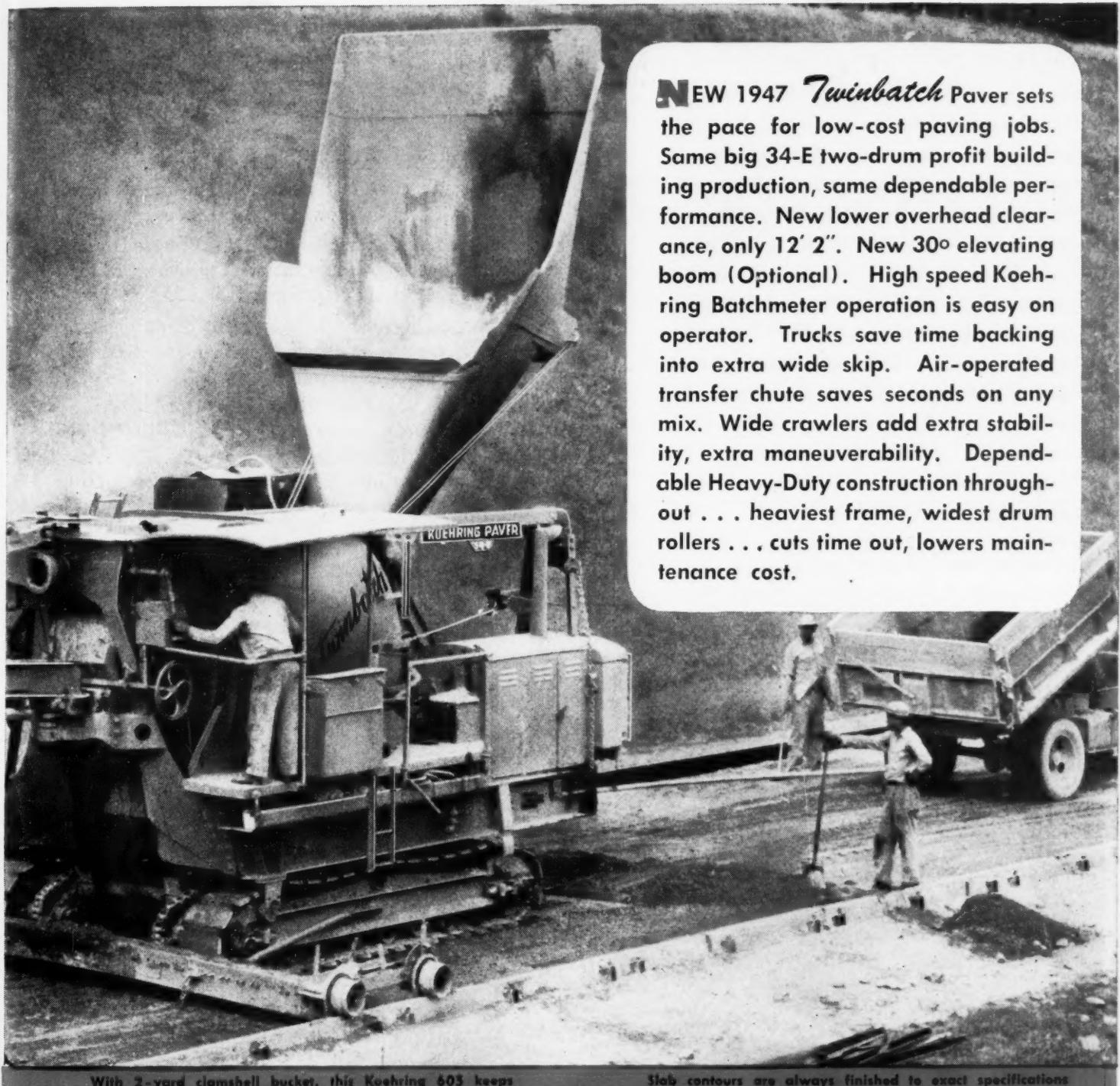
**GRADING TO FINISHING, IT'S KOEHRING FOR LOW COST**



For excavating and grading, check Koehring 605, new 1½ yard shovel. Built for rock work, heavy duty all through. Boom-foot shock absorbers protect entire machine from digging strains. Many new features.



Hauling costs less with Koehring Dumpers. Instant gravity dump. Reverse and forward travel at same high speeds. Strength to take beating of shovel loading, shocks of fast travel over rough roads.



**NEW 1947 Twinbatch Paver** sets the pace for low-cost paving jobs. Same big 34-E two-drum profit building production, same dependable performance. New lower overhead clearance, only 12' 2". New 30° elevating boom (Optional). High speed Koehring Batchmeter operation is easy on operator. Trucks save time backing into extra wide skip. Air-operated transfer chute saves seconds on any mix. Wide crawlers add extra stability, extra maneuverability. Dependable Heavy-Duty construction throughout . . . heaviest frame, widest drum rollers . . . cuts time out, lowers maintenance cost.

With 2-yard clamshell bucket, this Koehring 603 keeps batch plant humming. Power clutch eliminates operator fatigue. "Skylight" gives high vision.

Slab contours are always finished to exact specifications with a Koehring Longitudinal Finisher on slab. A Koehring exclusive, this unit largely eliminates hand finishing.



**KOEHRING COMPANY** Milwaukee 10, Wisconsin  
Subsidiaries: JOHNSON • KWIK-MIX • PARSONS



# Have You a Tough Contract Problem?

## 1 CORRECT LUBRICATION

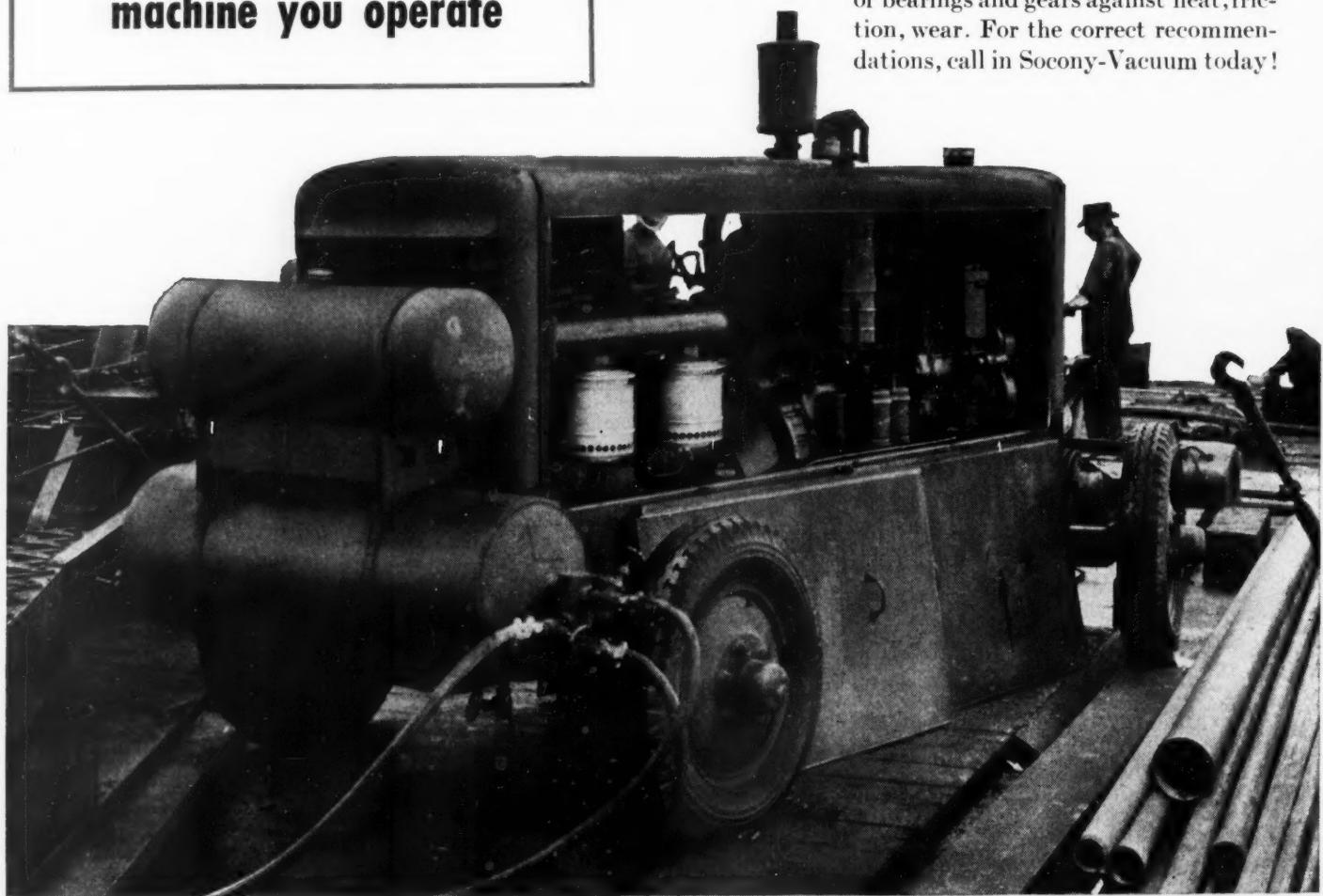
for every part of every  
machine you operate

THE RIGHT LUBRICANT applied the *right* way at the *right* time means faster machine output — fewer breakdowns, fewer slowdowns for repairs.

Socony-Vacuum offers: technically correct oils and greases that meet *every* lubrication requirement of air compressors, steam shovels, power tools . . .

. . . oils specially made to help resist costly deposit formation and corrosion—help keep high-speed Diesel and gasoline engines *cleaner*, better-running . . .

. . . top-quality lubricants that help protect *all* types of bearings and gears against heat, friction, wear. For the correct recommendations, call in Socony-Vacuum today!



Rely on SOCONY-VACUUM  
CONTRACTORS' SERVICE

# Put this Program TO WORK FOR YOU!

## ② TIME-SAVING SERVICE

for all divisions  
of your operation



HERE ARE just a few of the ways we help you ease tight work schedules, meet and beat contract deadlines:

1. Supply you with tested maintenance schedules adapted to *your* equipment, *your* set-up.
2. Give you practical help on "problem" machines.
3. Provide information on the Do's and Don't's of Correct Lubrication.

4. Supply the requirements for oils and greases for all of your equipment.
5. Help simplify lubricant inventory problems.

\* \* \*

On the job, in the shop and in the office . . . all through your operation, this service saves valuable time! See your Socony-Vacuum Representative today for full details.

SOCONY-VACUUM OIL COMPANY, INC., and Affiliates: Magnolia Petroleum Company, General Petroleum Corporation



# ATLAS SPEED FORMS

Now That You Must SAVE  
Where You CAN Save

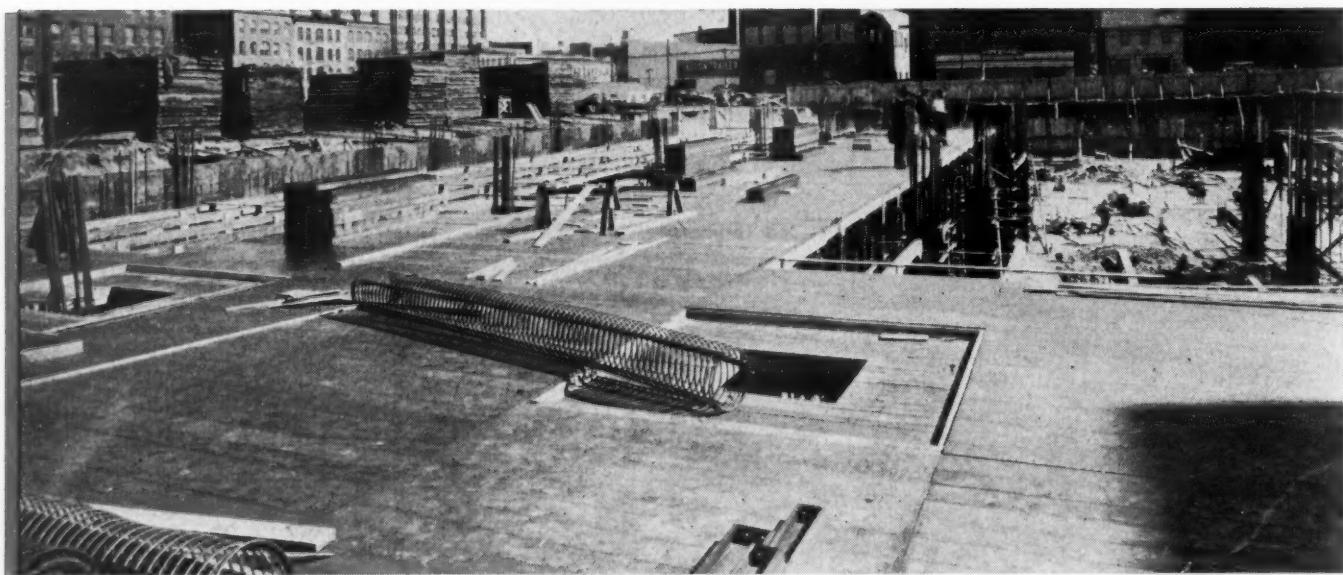
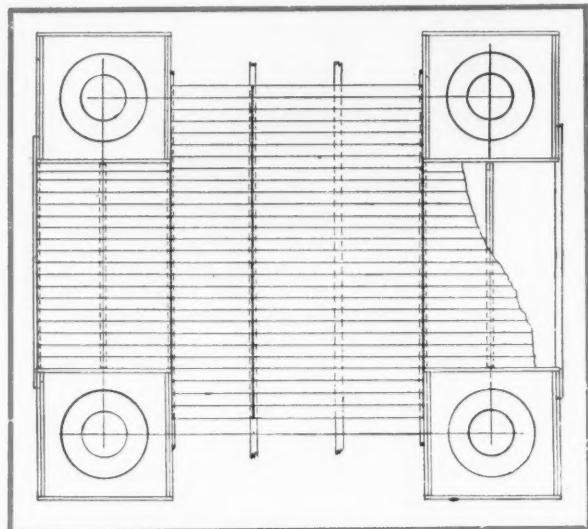
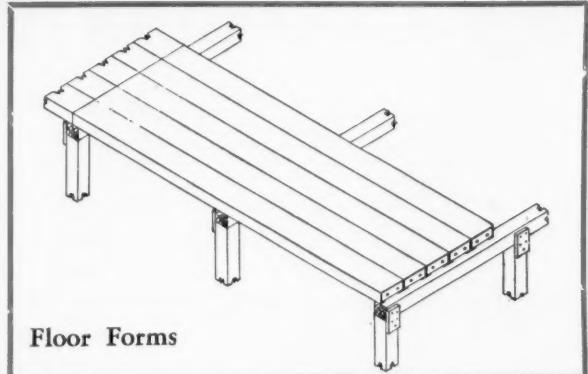
Cut Form Labor costs 25 to 75 per cent. New method of concrete construction. Steel Forms—easy to set, move and strip. Light-weight—anyone can handle them. Rigid—no nailing required. Let us show you how much Atlas Engineering and SPEED Forms CAN Save for you. Write for illustrated folder.

Available Now For Rent or Sale

**Irvington Form & Tank Corp.**

Write Dept. MC      IRVINGTON 37, NEW YORK

New York City Sales Offices - 43 Cedar St.



Sears Roebuck & Co. retail store at Dayton, Ohio. Hillsmith & Co., contractors; Nimmons, Carr & Wright, Architects-Engineers.

SLAB FORMS - WALL FORMS - PILASTER AND COLUMN FORMS.

# STRICTLY A "FAMILY AFFAIR"



One hundred per cent "Caterpillar" Diesel-powered! That's the strategy that put this stretch of new Florida highway through like a breeze. For fast rock and gravel hauling, "Caterpillar" Diesel DW10 Tractors and W10 Wagons shuttled between pit and fill. A "Caterpillar" Diesel-powered shovel did the loading. A "Caterpillar" Diesel D6 Tractor did the spreading.

It's always a decisive advantage when "Caterpillar" equipment dominates the job. Operators become more expert. There's no question about the equipment's power, ruggedness and dependability. It is easy to service. There's only one dealer organization—widely regarded as the most complete and efficient of its kind—to deal with. Replacement parts, when eventually needed, are "the real thing"—as sure-fitting and high in quality as the original.

Today's "Caterpillar" line is more complete than ever before—with "Caterpillar" Bulldozers, Scrapers and Wagons joining the family of "Caterpillar" Diesel track-type and wheel-type Tractors, Motor Graders, Engines and Electric Sets for all kinds of contracting power equipment.

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS



**CATERPILLAR**  
REG. U.S. PAT. OFF.  
**DIESEL** ENGINES • TRACTORS  
MOTOR GRADERS  
EARTHMOVING EQUIPMENT



**"Mr. Big"**  
of the construction  
industry!

● All around the world, AMERICAN REVOLVER cranes have helped erect mammoth dams, bridges, shipyards and other "capital" structures. We are building AMERICAN REVOLVERS continuously . . . designing and manufacturing them complete. Users everywhere will vouch for their through-and-through excellence.

**American Hoist**  
and DERRICK COMPANY  
Saint Paul 1, Minnesota

Plant No. 2, SO. KEARNY, NEW JERSEY  
*Sales Offices:* CHICAGO • PITTSBURGH  
NEW YORK • NEW ORLEANS • SAN FRANCISCO

# NO NAILS — NO BOLTS NEEDED TO MAKE THESE *Safe* SCAFFOLDS



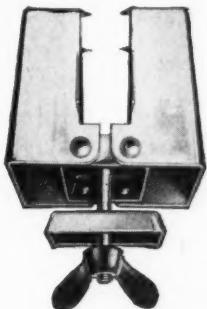
Du-All Brackets used for many purposes. Ramps and all types and sizes of scaffolding.

## USE DU-ALL *Safe* BRACKETS to make scaffolds on the JOB — ANY HEIGHT!

No waste, no nailing, no bolting with these sturdy brackets that make scaffolds any height with any standard 2" lumber. Many times stronger than the lumber itself.

Du-All Brackets pay for themselves on the first job as unskilled labor can erect trestles quickly. Lumber is not damaged, can be re-used. No shaping is required, no bolts or nails used.

Du-All Brackets have been proved on the job by hundreds of general contractors, road contractors, bricklayers and carpenters throughout the country.



### TRY THEM

\$4.25 per pair for ten pairs or more.  
(One to nine pairs—\$4.50.) Detailed folder sent on request.

SOME EXCLUSIVE TERRITORIES  
FOR AGENTS STILL AVAILABLE

**DU-ALL SCAFFOLD BRACKET CO.**  
DEPT. E, 44 E. BROAD ST., COLUMBUS 15, OHIO



Quickly assembled on the job. Makes safe scaffolds many times stronger than the lumber itself.

MEMO TO ALL CONSTRUCTION SUPTS.

Haiss Service Costs upset  
all statistics. Better check it  
for our loading requirements

F.W.H.



Simple Conversion Mountings. Haiss simplified design of the Model 75 provides for interchange of wheels and creepers, in the field. Standard parts; no shop work.

Watch a Haiss in action—or, better still, get the *feel* of its ease of control as it "crowds" a stock pile or bank—and in no time at all you'll see why Haiss doesn't aim at price.

What Haiss does aim at—and builds—is a Loader that can absorb punishment...a Loader that will deliver more yards for more years with less

maintenance and lower operating costs.

To insure this *bargain-on-the-job* Haiss makes full use of simple, functional design...takes the pick of the best alloy steels available...designs its own oil-bath-enclosed transmission—and powers the works with a motor rugged enough to "take it."

Haiss operating efficiency has been paying big dividends for Haiss owners for more than a half-century. Investigate now what a Haiss can do for you. Catalogs containing complete information will be sent promptly on request.

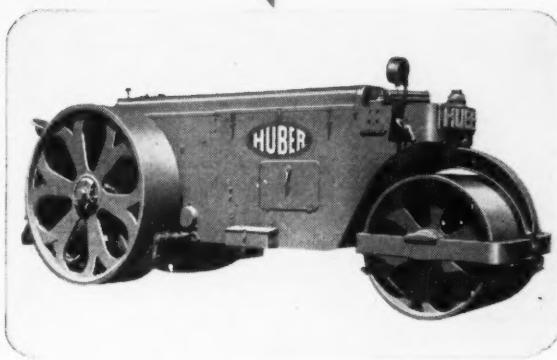
**GEORGE HAISS MFG. CO., INC.**

139th Street and Canal Place  
New York 51, N. Y.

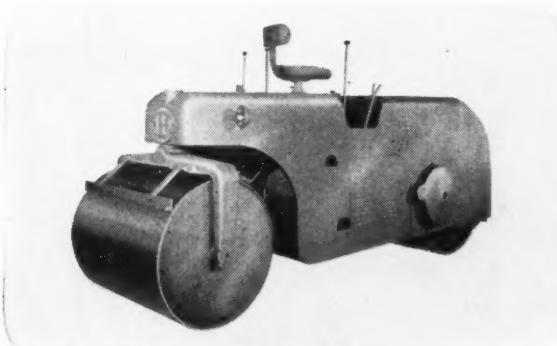


**PORTABLE CONVEYORS ★ SNOW LOADERS ★ CLAMSHELL BUCKETS**

**"A Ringer" EVERY TIME**

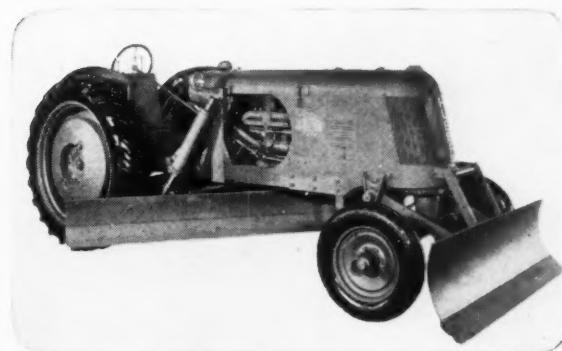
HUBER 3-WHEEL ROLLERS  
Automotive type, built in sizes from 5 to 12 ton.



HUBER TANDEM ROLLERS  
Variable weight, built in sizes from 3 to 12 ton.

There is no guesswork to buying Huber Road Machinery. Whether you buy a Huber 3-Wheel Roller, a Huber Tandem Roller, or the Huber Maintainer you run up a winning score in simple design for easy maintenance, speedy operation, plenty of power and stamina, maximum economy, and dependable performance. To hold the confidence of Road Builders continuously for better than 35 years—ever since the first Huber Roller was built—cannot be ignored when it comes to selecting future road machinery.

Drop in and see your Huber Distributor for a demonstration.



HUBER MAINTAINER  
A versatile machine that also serves as a bulldozer, lift-loader, patch roller, snowplow, or rotary broom.

THE  MFG. COMPANY • MARION, OHIO, U. S. A.

**HUBER**

3 Wheel • Tandem  
**ROAD ROLLERS**  
and  
**MAINTAINERS**

# Higher Densities in Earth Fills at LOWER COST with the SEAMAN MIXER

In processing for high-density compaction in earth fills, proper soil pulverization and the proper mixture of soil and water is just as important as the rolling.

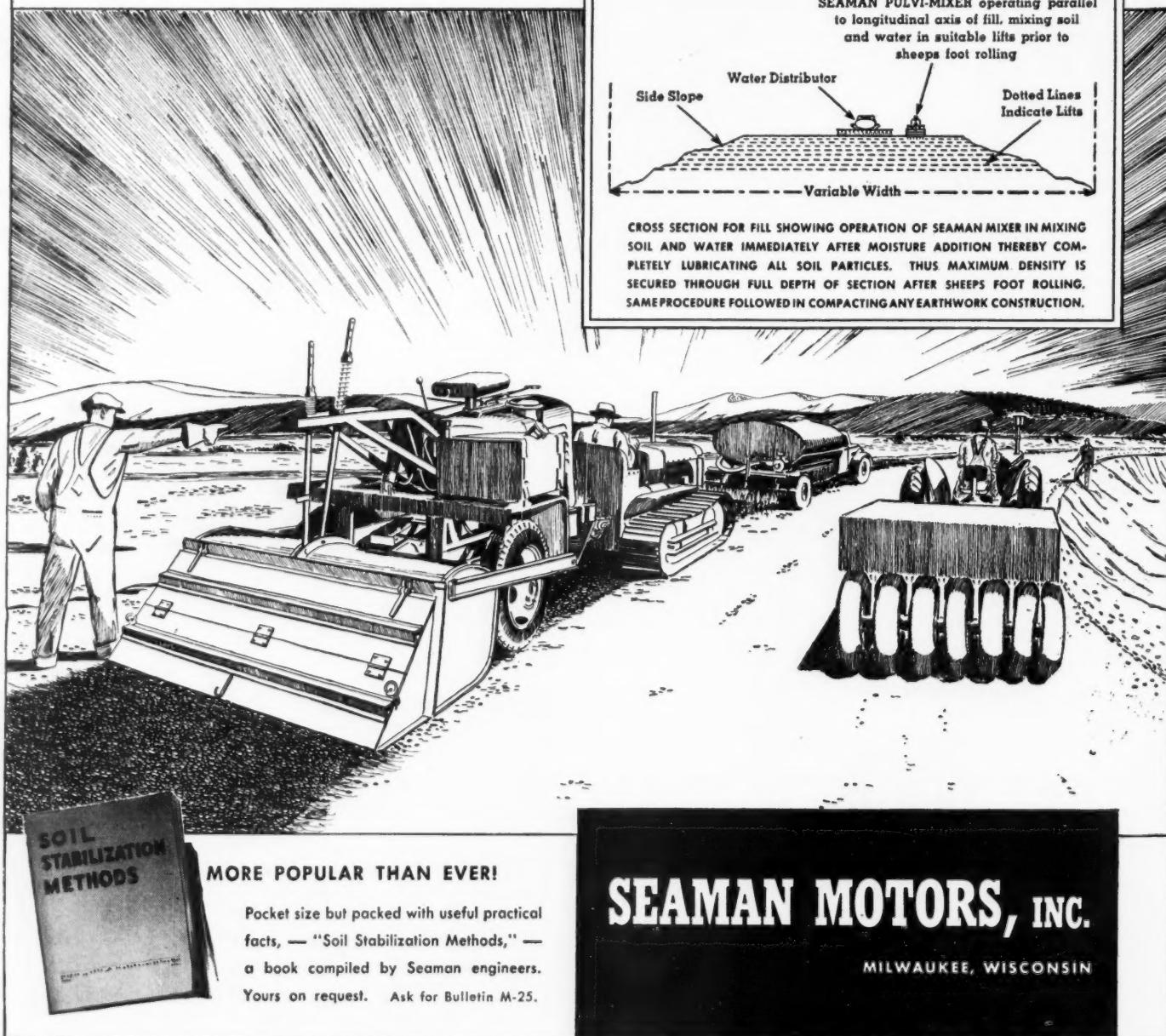
Good proof of this is shown in the construction of the Santa Monica (Calif.) Municipal Airport where all embankments and subgrades under runway and taxiway pavements were required to be highly compacted by a

pneumatic roller ballasted to 100 tons. A scarifier was used to precondition the soil.

As the work progressed, densities were unsatisfactory, averaging about 92%, despite a great increase in the passes made by the roller.

Then the contractor bought a SEAMAN MIXER. Where 7 passes of the water distributor had been made to add 9% of moisture, the full 9% was put into the lift at once and the SEAMAN effected a thorough, completely uniform mix. And, after rolling, densities soared to 98.5% with many at 100% of maximum. Later, roller passes were reduced from 16 to 8 yet densities held at those levels.

The secret is the SEAMAN with its ability to pulverize, blend, mix, cross-mix and turn so that moisture, the essential soil-particle lubricant, is distributed evenly throughout the lift.



**SEAMAN MOTORS, INC.**

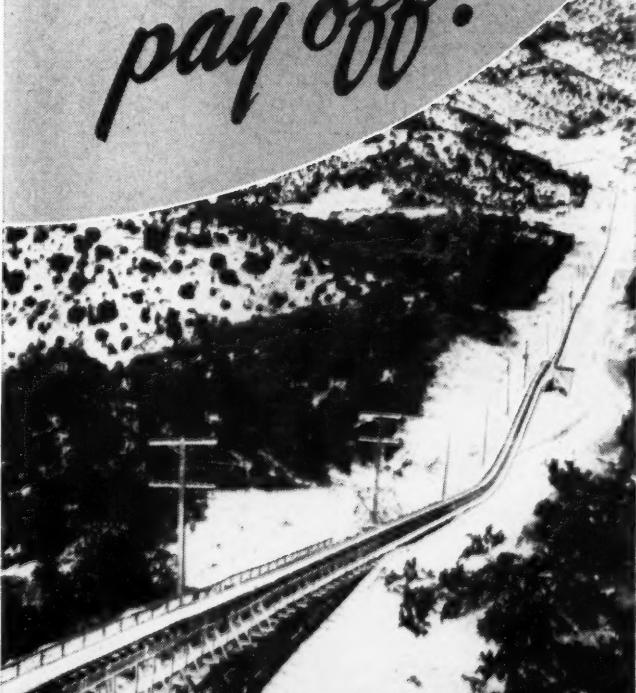
MILWAUKEE, WISCONSIN



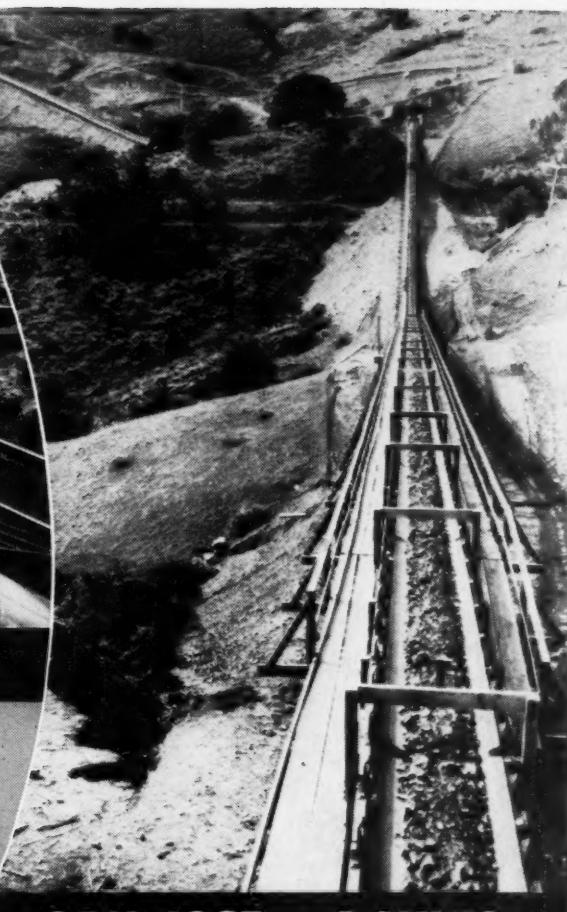
**GRAND COULEE...2 MILES**

## HOW LONG CAN A CONVEYOR BE . . .

*and still  
pay off?*



**SHASTA...10 MILES**



**SAN JOSE...4 MILES**

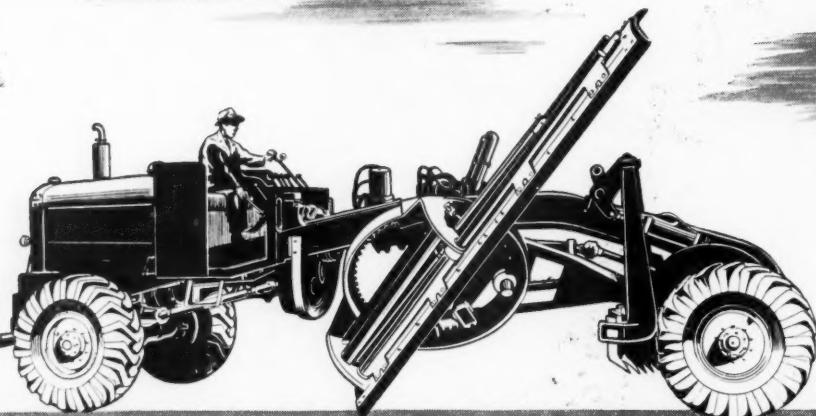
On large construction projects, conveyors have long been the accepted tool for moving bulk materials in a continuous flow over short and medium distances . . . but how about relatively long hauls? Based on present data, 30 to 50 miles is probably the economic limit—one conveyor now under consideration would be 38 miles long, and there is every reason to believe that conveyor lengths may reach 50 miles in the near future.

Regardless of the length to which conveyors may grow, their electrification will not be a limiting factor. One-point electric control for the entire conveyor system is now possible, as well as electrical interlocking to prevent piling-up of material at flight junctions. On down-hill runs, conveyor drive motors can function as generators and pump power back into the line . . . one conveyor system actually generated more power than it consumed, once it was placed in motion.

Conveyors are just one of many electrified construction tools on which General Electric engineers are working in co-operation with equipment manufacturers and contractors to speed construction and keep initial, operating, and maintenance costs at a minimum. Ask your G-E representative how electrification of your construction equipment can help you make a better product at lower cost. *General Electric Company, Schenectady 5, N. Y.*

**GENERAL ELECTRIC**

All-Wheel Drive and Steer • High Lift Blade • Extreme Reach • Completely Reversible Blade



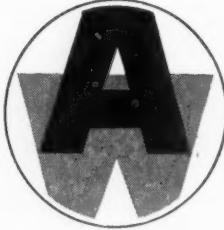
*there is No Substitute*

**FOR ALL-WHEEL DRIVE  
AND ALL-WHEEL STEER**

in a motor grader... no way in which any rear drive, front steer machine can equal the maneuverability, power-at-the-blade and all-around performance of the 99-H Power Grader.

Get the complete story of the many additional features of the 99-H from your A-W distributor, or send for the latest bulletin.

**AUSTIN-WESTERN COMPANY, AURORA, ILLINOIS, U. S. A.**

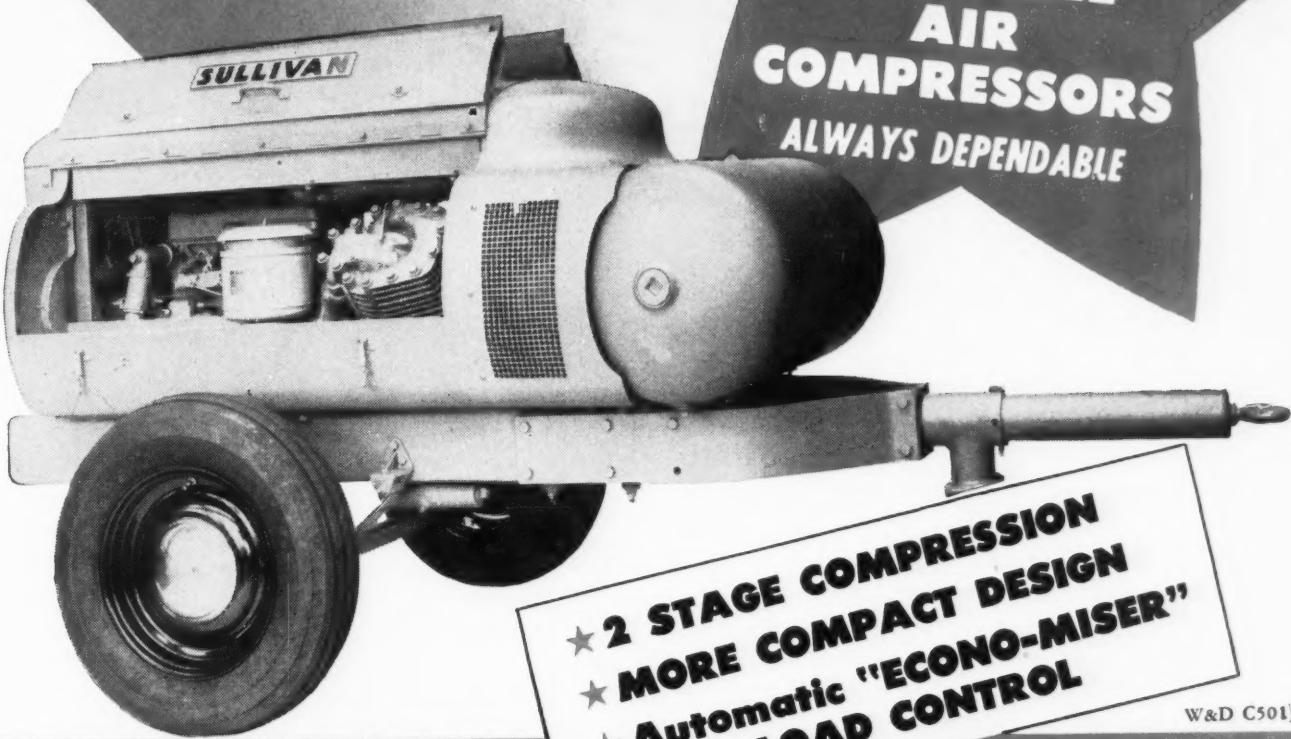
**Austin**  **Western**



# PEAK AIR POWER ON THE JOB



THE NEW  
**SULLIVAN**  
SERIES 80  
**PORTABLE**  
**AIR**  
**COMPRESSORS**  
ALWAYS DEPENDABLE



W&D C501



Write for Bulletin

## SULLIVAN

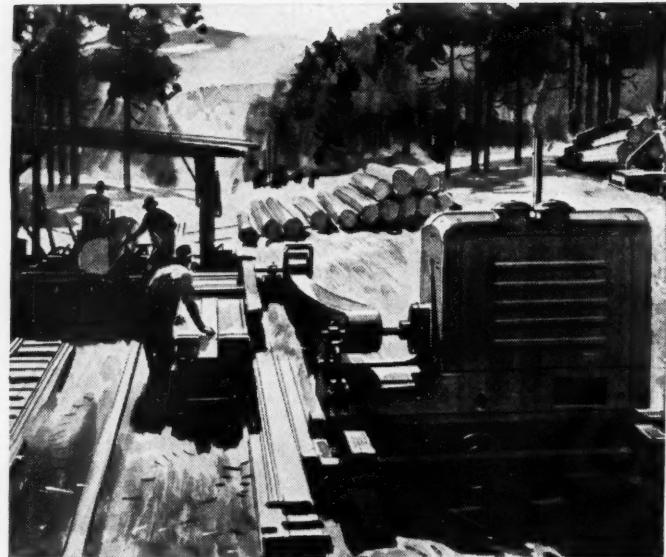
"The World's Most Modern Portable Compressed Air Plant"

PORTABLE AIR COMPRESSORS FROM 60 TO 630 CFM

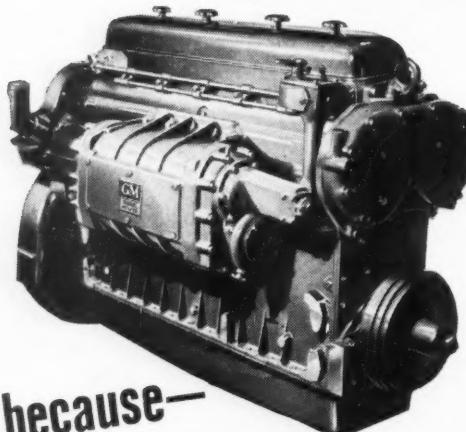
SULLIVAN DIVISION

### JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING, PITTSBURGH, PA.



## Bring on the hard work



*Here's  
the Engine  
for it!*

because—

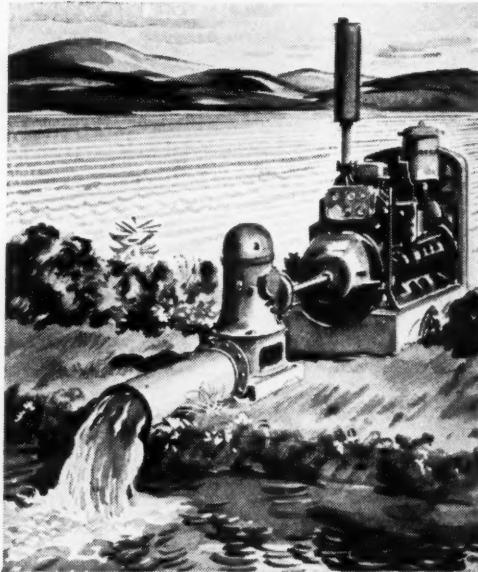
## there's power at every downstroke

NO matter where a General Motors Diesel engine goes to work, you can count on a smooth, steady flow of power. Because each piston downstroke is a power stroke, there are twice the number of power impulses for each turn of the shaft. A "six" is as smooth as a "twelve" in an ordinary engine.

Besides the e's better acceleration under a load—and starting's quicker.

So it's easy to see why GM Diesels are "naturals" wherever a steady, sturdy, smooth source of power is required—why they are top-notch for lumbering, fishing, construction, well drilling and for every job where tough, compact, dependable power is needed.

So, no matter what your requirements might be, if you want sturdy, money-making, safe power, be sure to look into General Motors Diesel engines.



**DETROIT DIESEL ENGINE DIVISION**

DETROIT 23, MICH. • | SINGLE ENGINES . . Up to 200 H.P.  
GENERAL MOTORS | MULTIPLE UNITS . . Up to 800 H.P.

**GM**  
GENERAL MOTORS  
**DIESEL  
POWER**

DIESEL BRAWN \*  
WITHOUT THE  
BULK



**TO "STEEL" THE SHOW**

**USE LORAINS**

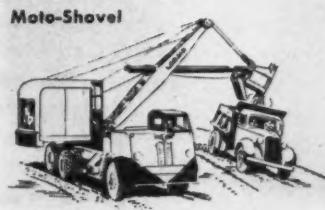
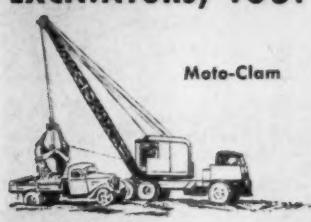


**I**F it's a smooth-running, fast-moving steel erecting job, you're certain to find a Lorain Moto-Crane holding the center of the stage. Rubber-tire mobility permits these units to service every phase of the work—unloading at the team track, sorting, distributing, erecting steel on the job—quickly and economically. Possessing the power and strength for a "belly lift" and the capacity and range for a boarding-house

reach, Moto-Cranes measure up to the many varied precision handling requirements typical of such jobs.

Lorain Moto-Cranes are available in a wide range of capacities on 4 or 6 wheel rubber-tire mountings with or without front wheel drive. And they offer a combination of features that get steel up and costs down in a hurry. Ask your local Thew-Lorain distributor for complete information now.

**USE RUBBER-TIRE EXCAVATORS, TOO!**



**THE  
THEW SHOVEL COMPANY  
LORAIN, OHIO**

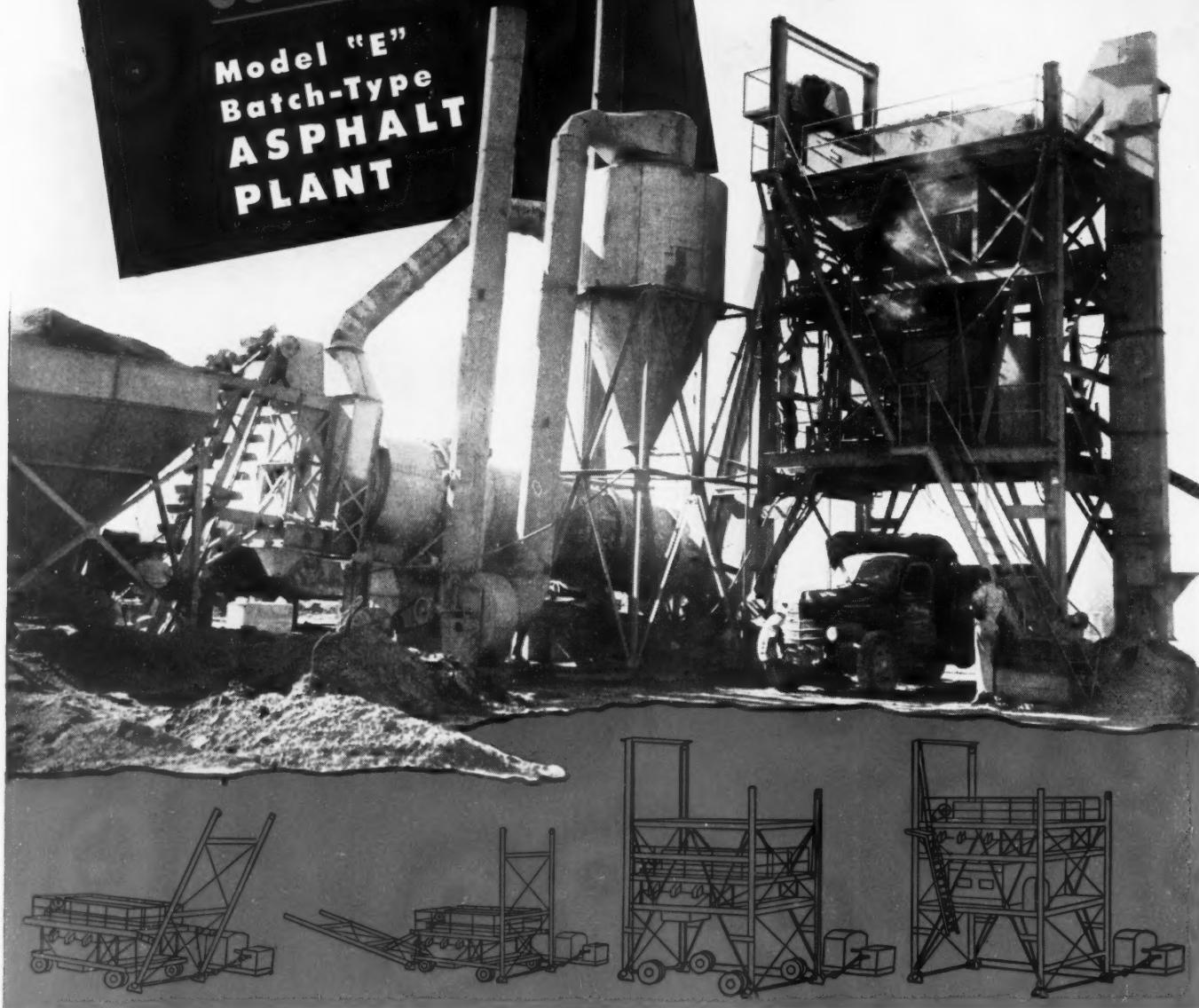
Reg. Trade Mark  
**thew. Lorain**

**CRANES • SHOVELS • DRAGLINES • MOTO-CRANES**



# Cedarapids

Model "E"  
Batch-Type  
**ASPHALT  
PLANT**



## The only 3,000- or 4,000-lb. plant that's COMPLETELY PORTABLE

The Cedarapids Model "E" has plenty of capacity for your biggest black-top jobs—up to 4000 lbs. per batch of thoroughly mixed aggregates and bitumen. It can turn out the mix right on the site of the job and then easily and quickly move on to the next job.

Separate, related units with a minimum number of assembly connections and a simple power raising unit make it easy to set up and take down. No shovel or crane neces-

sary. Will handle hot or cold mixes and may be operated by electric, gasoline or diesel power. With a Cedarapids Model "E", you can furnish plant-mix asphaltic aggregates in localities that you formerly had to miss.

When you buy an asphalt plant, buy the best, buy Cedarapids. For accurate batching, high capacity and portability—buy a Model "E". See your nearest Cedarapids dealer for details.

**THE  
IOWA  
LINE**

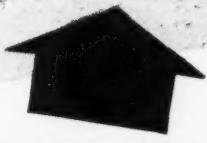
**IOWA MANUFACTURING COMPANY**

Cedar Rapids, Iowa, U. S. A.

*of Material Handling Equipment Includes:* ROCK AND GRAVEL CRUSHERS • BELT CONVEYORS • STEEL BINS • BUCKET ELEVATORS • VIBRATOR AND REVOLVING SCREENS • STRAIGHT LINE ROCK AND GRAVEL PLANTS • FEEDERS • TRAPS • PORTABLE POWER CONVEYORS • PORTABLE STONE PLANTS • PORTABLE GRAVEL PLANTS • REDUCTION CRUSHERS • BATCH TYPE ASPHALT PLANTS • DRAG SCRAPER TANKS • WASHING PLANTS • TRACTOR-CRUSHER PLANTS • STEEL TRUCKS & TRAILERS • KUBIT IMPACT BREAKERS

# INGRAM ROLLERS

... chosen for the job of keeping  
the Pennsylvania Turnpike America's  
finest highway . . .



## 5 SIZES 4 to 12 TONS

Manufactured by ACME WIRE AND IRON WORKS—San Antonio 6, Texas

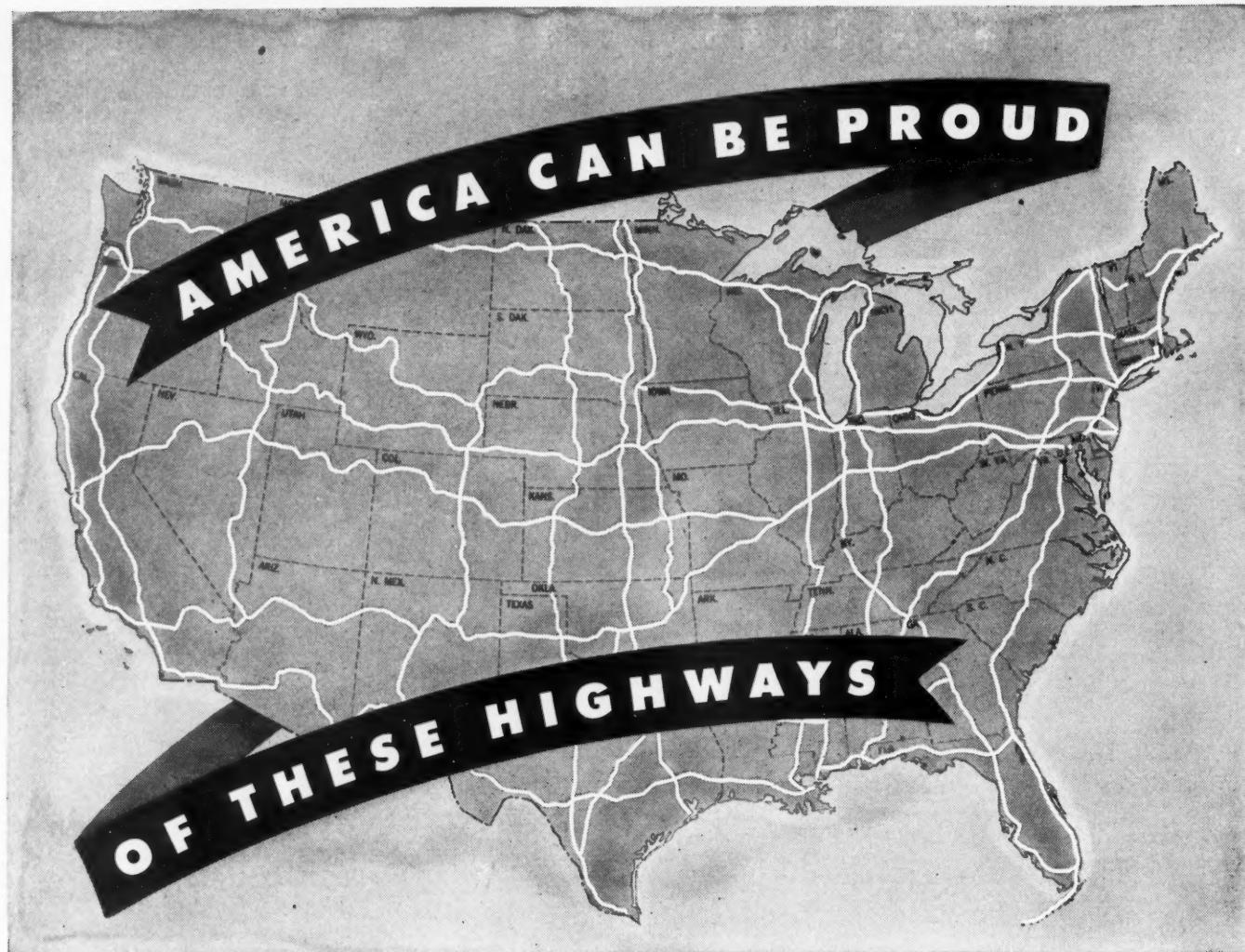
See Your Distributor—

THE ARNOLD COMPANY  
Bridgeport, Connecticut  
BEMIS EQUIPMENT CORP.  
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HERMAN M. BROWN  
Des Moines, Iowa  
CONSTRUCTION EQUIP. SALES, INC.  
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Pittsburgh, Pennsylvania  
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Milwaukee, Wisconsin  
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EQUIPMENT SALES & MFG. CO.  
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R. O. HARDCASTLE CO.  
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C. G. HEWITT MACHINERY  
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L. Z. HOWELL CO.  
Chicago, Illinois  
INLAND TRUCK & DIESEL CO.  
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KERN-LIMERICK, INC.  
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Seattle, Washington  
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SHEPPARD & BOGIE EQUIP. CO.  
Lexington, Kentucky  
STATHAM MACH. & EQUIP. CO.  
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Washington, D. C.  
GEORGE P. WILLIAMS CO.  
Cleveland, Ohio  
WILSON EQUIP. & SUPPLY CO.  
Cheyenne, Wyoming



Shown on the map above are a few of the principal highways of the great U. S. highway network, now 31 years old and begun with passage by Congress of the Federal-Aid Road Act in 1916. And it's just 21 years since U. S. highways have been uniformly marked, with north-south routes given odd numbers from 1 to 101, and east-west routes even numbers from 2 to 90. U. S. feeder routes have higher numbers with final digits referring to the main roads they serve.

There's a lot of history and romance in our highways, many of them following old wagon trails of pioneer days. What tourist, planning a long motor trip, hasn't thrilled to vistas opened up by U. S. 1 . . . U. S. 11 . . . U. S. 41 . . . U. S. 2 . . . U. S. 30 . . . U. S. 40 . . . ribboning away for hundreds of miles, up and down and across the land? And what businessman or salesman, travel-

ing long distances by automobile, hasn't been conscious of the benefits afforded by Federal highways?

By supplying contractors with the steel products needed for modern concrete roads and for bridges of all types, Bethlehem has had a part in the building of many of the important links in our national highway system. Today, with so many highways to be repaired or relocated, and new bridges built, Bethlehem again offers well-rounded service and a line of road steels designed and built for top-notch performance. If you have a highway job coming up in the near future, we suggest you get in touch with the nearest Bethlehem district office.

#### BETHLEHEM STEEL COMPANY Bethlehem, Pa.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

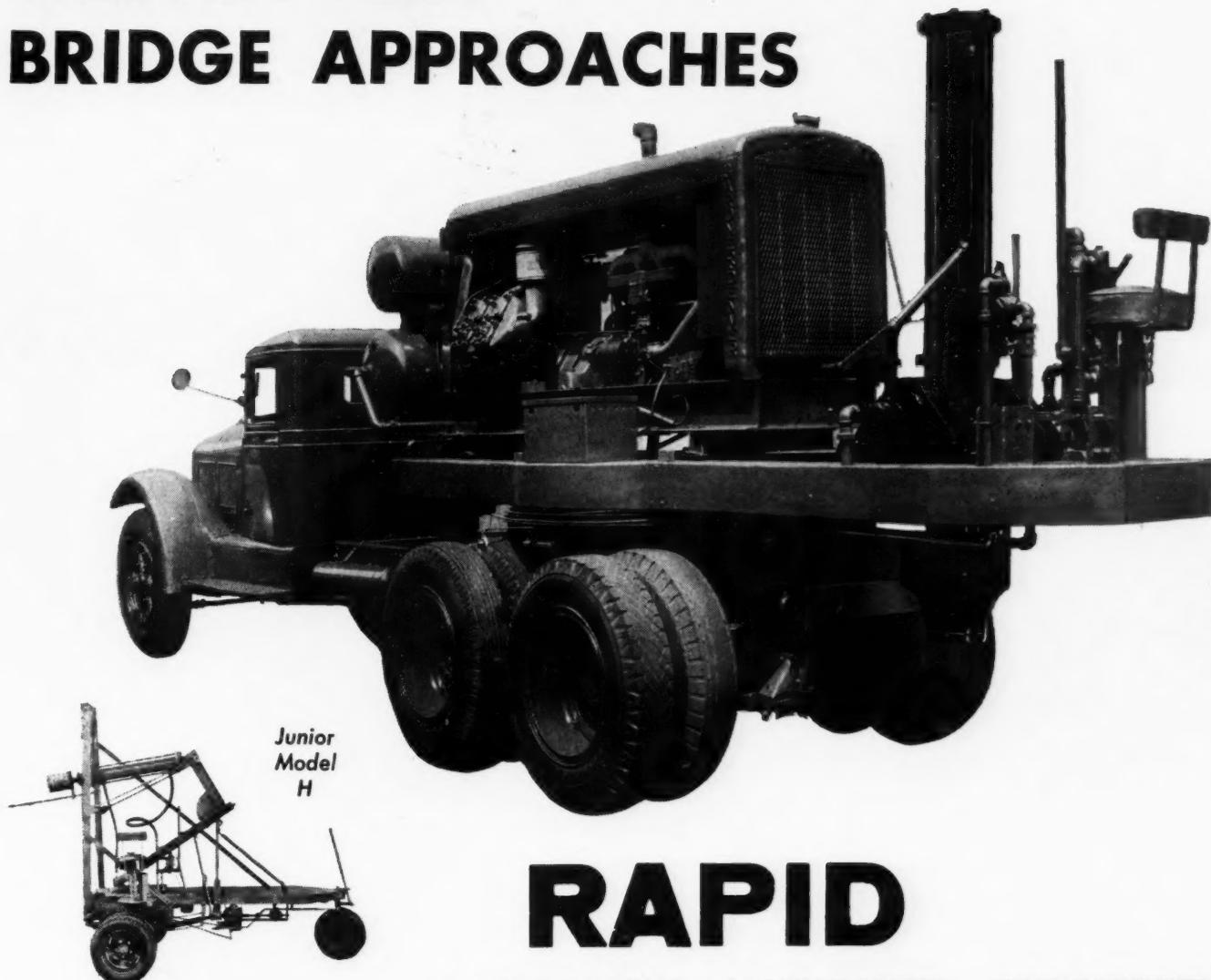
#### LEADING BETHLEHEM HIGHWAY PRODUCTS

- Road Joints
- Reinforcing Bars
- Bar Mats
- Guard Rail
- Guard Rail Posts
- Wire Rope
- Pipe
- Hollow Drill Steel
- Fabricated Structural Steel
- Sheet and H-Piling
- Corrugated Sheets
- Timber Bridge Hardware
- Tie Rods, Spikes, Bolts and Nuts

## STEEL FOR HIGHWAYS



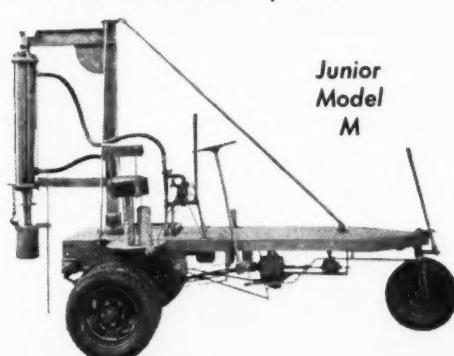
# UNEQUALED FOR TAMPING TRENCH AND BRIDGE APPROACHES



## RAPID PAVEMENT BREAKER MACHINES

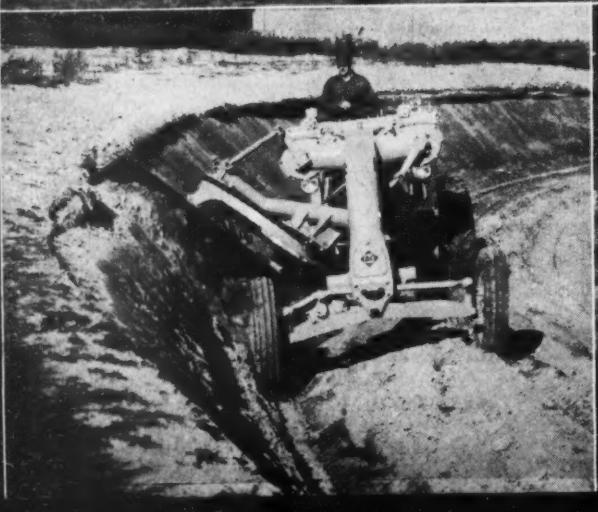
- Model-H can be converted to vertical machine in 30 minutes.
- Junior Model T for mounting on truck with compressor also available.
- Write for details and prices.

- Unequaled performance in concrete breaking.
- Fastest pneumatic method.
- Not a drop weight, but a pneumatic controlled blow.
- Average working speed, 55 blows per minute.
- Saves labor-time-dollars.
- Built to have a low upkeep cost.
- Breaks to any size desired.
- Adapted to inside or outside work.
- Increases your compressor output.
- Ideal for cutting trench and tamping backfill.
- The profitable addition to your line of equipment.
- Heavy-duty machine equipped with air motor which pivots the unit on the truck bed.
- Junior Trailer Models are equipped with air motor that propels machine and swings the boom.



**R. P. B. CORP.**  
1517 Santa Fe Ave. Los Angeles 21, Calif.

# MORE



# WORK-POWER

With owners and operators, it's Performance that Counts! The capacity of a Motor Grader is measured by the work it accomplishes.

Here's why the Allis-Chalmers AD Motor Grader more than meets their requirements:

**TRAVEL SPEEDS** smoothly synchronized with **OPERATOR CONTROLS**... All the needed power applied as required.

**BIG WORKING CLEARANCE.** 28" throat clearance handles bigger windrows without interference.

**"ROLL-AWAY" MOLDBOARD.** Requires less power to handle bigger loads at faster speeds. Material is *rolled*, not pushed.

**21,500 LBS. EFFECTIVE WEIGHT.** Balanced for maximum traction and control.

**FULL CIRCLE REVOLVING BLADE.** Swings ahead of platform with plenty of end clearance.

**EXCLUSIVE TUBULAR FRAME.** Strong, shock-absorbing, protects control rods inside frame.

**ELECTRIC BRAKES.** Control positive, operate with less effort than auto brakes.

**FAMOUS 2-CYCLE DIESEL POWER.** Dependable, economical, instant-starting.

Users appreciate these features that definitely lessen fatigue—that keep efficiency at a high level—that pay off in more work accomplished.

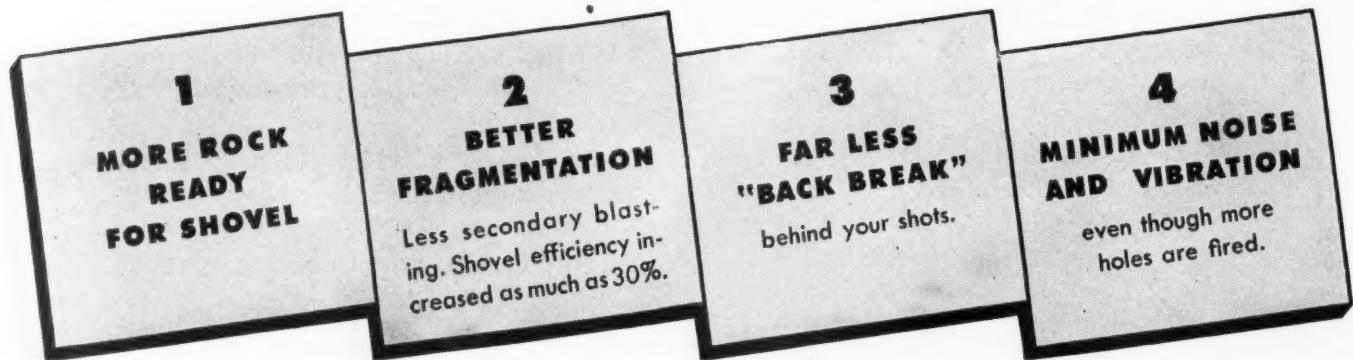
**ALLIS-CHALMERS**  
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.



# ATLAS ROCKMASTER BLASTING SYSTEM

*The original milli-second delay system*

Introduced in 1945.. Now Widely Acclaimed  
for Four Outstanding Reasons



No question about it—Atlas Rockmaster, the sensational blasting system introduced in 1945 after extensive study, is now enthusiastically accepted by blasters everywhere. Rockmaster very definitely muffles noise and vibration, even when more holes are fired. It blasts more rock ready for the shovel. It assures better fragmentation. It reduces "back break." *Two years of experience prove it!*

Day after day—in quarries, strip pits, on construction work, even in underground mines—Rockmaster is increasing production. Doubters have been so thoroughly convinced that

more than 2,000,000 Rockmaster Electric Detonators were sold in 1946 alone.

Rockmaster is more than a detonating device—it is a whole new method of blasting, tailored to fit each individual job. It enables the blaster to time the delay elements of his shot to within thousandths of a second, an accomplishment never possible before.

Insist on the genuine Atlas Rockmaster, developed by the pioneers of split-second time delay. It has given results on hundreds of jobs that might easily be duplicated on yours. Call in the Atlas representative.



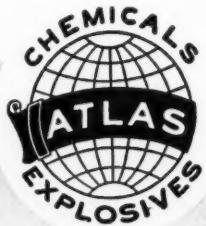
*Less Bark . . . More Bite*

"ROCKMASTER"—Trade Mark

# ATLAS EXPLOSIVES

*"Everything for Blasting"*

ATLAS POWDER COMPANY, Wilmington 99, Del. • Offices in principal cities • Cable Address—Atpowco



# TOWN FLOODED OUT



Flooded streets of Warren, Pa.,  
Saturday night, April 5.



Foundation of nearby Warren Power Plant—Dry!

## FOUNDATION (<sup>ADJACENT TO RIVER</sup>) DRY

In spite of a ten-foot rise in the Allegheny River which parallels the site of the Warren Power Plant, a Moretrench Wellpoint System was able to "hold the job under control and to keep it workable all during the flood." (Quotation from our supervisor's report of April 5, 1947.)

## MORETRENCH EQUIPMENT MORETRENCH KNOW-HOW

—a combination that's hard to beat—even by a flood!

On your wet job  
Moretrench equipment  
is your guarantee of  
daily progress.  
**"IN THE DRY"**

**MORETRENCH CORPORATION**

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New York 6

3037 S. Christiana Ave.  
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Tampa 6, Florida

315 W. 25th St.  
Houston 8, Texas

Rockaway  
New Jersey



# UNIT 357 MOBILE CRANE

- It's Self Propelled
- It Rides on Rubber
- It Has 1001 Uses!

Fast, versatile industrial crane with plenty of LIFT ability . . . ideal for moving castings, steel, scrap, coal, lumber or even machine tools. Travels anywhere . . . on paved surfaces, cinders or just plain mud . . . gets there in a hurry. Available with crane hook, clamshell, or magnet . . . quickly convertible to any other attachment. Operated by ONE man . . . powered by ONE engine . . . controlled from ONE position in cab. Features include: Hydraulic steering . . . Air-actuated hydraulic brakes . . . One piece cast gear case. FULL VISION CAB, pioneered by UNIT, provides 360° visibility for greater safety and efficiency.

**5 Ton Capacity . . . 7 Tons with Outriggers**

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FACTORY DIRECT  
FOR PRICE AND  
DELIVERY

**UNIT CRANE & SHOVEL CORP.**



6305 WEST BURNHAM STREET  
MILWAUKEE 14, WISCONSIN, U. S. A.



# drilling magic

**...the flexibility and deep-hole drilling speed of Le Roi-Cleveland Wagon Drills produce unbelievably low-cost footage**

Here's a wagon drill that can practically turn itself inside out — it drills at any angle. This flexibility and the ease with which you can make set-up changes save you time and money—holes can be drilled in the most effective spots regardless of the contour of the ground. This, of course, means proper burden on the hole, better fragmentation, lower costs.

And power—say, when that 4-inch bore Le Roi-Cleveland Drifter starts hammering on a piece of drill steel, it keeps driving it down until you have a 40-foot hole. The advantages of this dependable machine's high drilling speed are made greater through the use of a quick-returning feed. Less time is lost in changing steel, so that much more footage is drilled per shift.

The throttle, feed, and blowing controls consist of a single, compact, conveniently located unit. This helpful feature gives the operator complete

control over the machine at all times. He can easily select the right feed for the formation being drilled.

Ask your Le Roi distributor to give you all the facts. Send for our latest wagon-drill bulletin.

\*Reg. U. S. Pat. Off.



*Le Roi  
Engine-generator  
Set*



*Le Roi  
Heavy-duty  
Engine*



*Le Roi  
105 Tractair\**



*Le Roi  
Airmaster\**

## LE ROI COMPANY

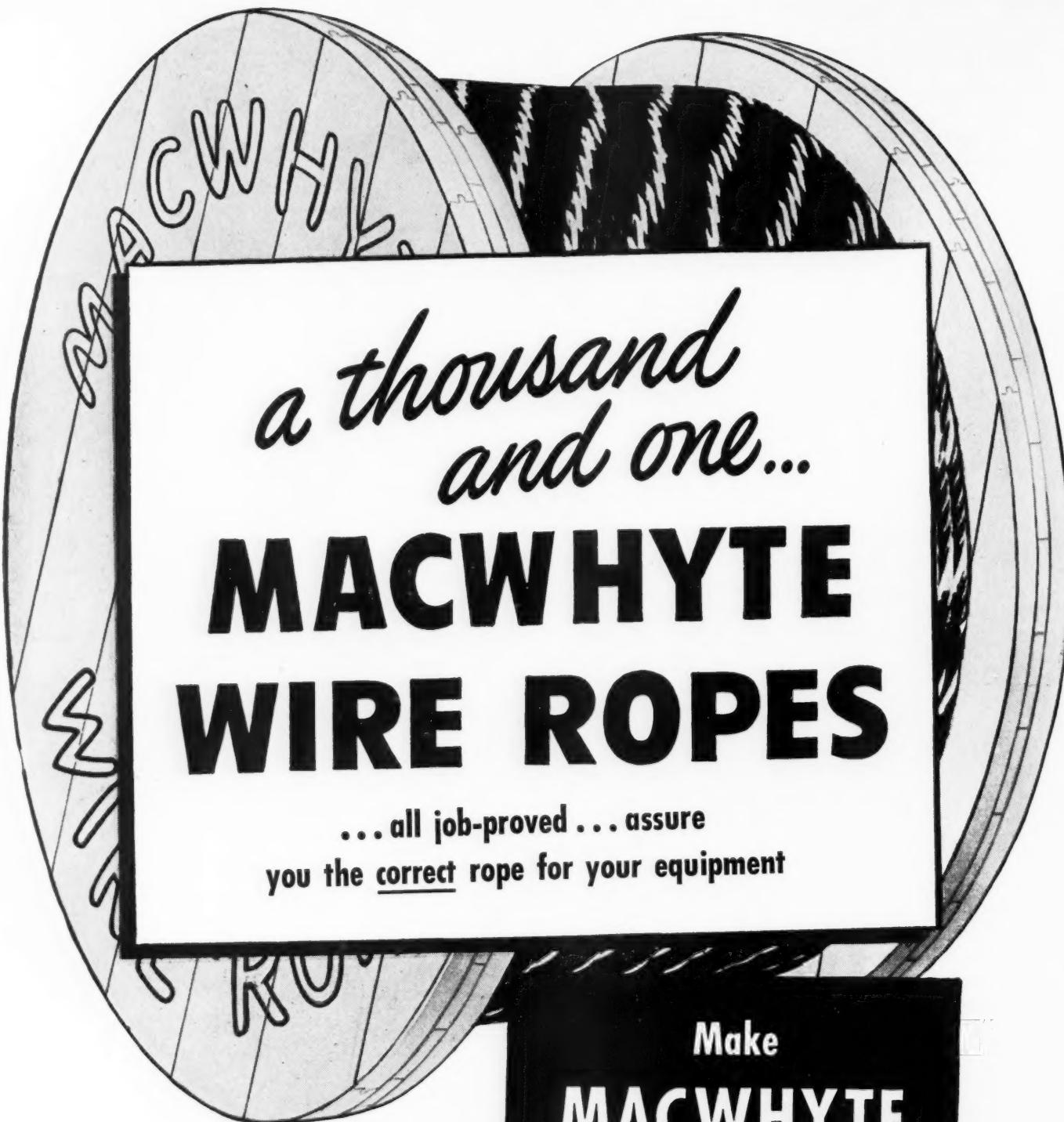


CLEVELAND DIVISION  
*Manufacturers of Cleveland Rock Drills*  
Cleveland 11, Ohio

LE ROI COMPANY, General Offices, Milwaukee 14, Wisconsin

NEW YORK • WASHINGTON • CLEVELAND • MILWAUKEE  
BIRMINGHAM • TULSA • BUTTE • SAN FRANCISCO

RD-6



*a thousand  
and one...*

# MACWHYTE WIRE ROPES

... all job-proved ... assure  
you the correct rope for your equipment

When you use the correct wire rope, both the rope and your equipment last longer, cost less to operate. Macwhyte consulting engineers will check your equipment and recommend the wire rope specifically engineered for your job. Ask your Macwhyte distributor, or write Macwhyte Company.

## MACWHYTE WIRE ROPE

Manufactured by Macwhyte Company  
2941 Fourteenth Avenue, Kenosha, Wis.

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San Francisco • Los Angeles • Distributors  
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NO. 915

Make

**MACWHYTE**  
your headquarters for  
**WIRE ROPE**  
and **SLINGS**

MACWHYTE PREFORMED AND NON-PREFORMED INTERNALLY LUBRICATED WIRE ROPES... MONARCH WHYTE STRAND Wire Rope... Special Traction Elevator Rope... Stainless Steel Wire Rope... Monel Metal Wire Rope... Galvanized Wire Rope. Macwhyte also makes Atlas Braided Wire Rope Slings, Hi-Fatigue Aircraft Cables, Assemblies, Tie-Rods. Catalogs on request.



## Add Extra Dependability

Ease of operation, adaptability and high output are important characteristics of the Model 105. Like other General Excavators, this nimble, one-man

Diamond No. 478  
Chain shown one-half size

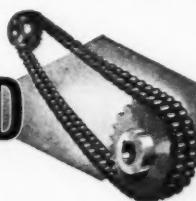
operated, rubber-mounted machine has drives in keeping with other superior details of design and construction—DIAMOND Roller Chain Drives.

On the engine and "crowd" drives, these widely preferred chains provide positive and sure means of transferring all the power *all the time*. DIAMOND Chains are known to machinery builder and user for their retained high efficiency (98-99%), inherent elasticity, and extreme durability that aid in profitable performance.

Practical assistance, when considering model changes or new machines, is available to help save you time. DIAMOND CHAIN COMPANY, Inc., Dept. 418, 402 Kentucky Avenue, Indianapolis 7, Ind. *Offices and Distributors in All Principal Cities.*



**DIAMOND**



**ROLLER  
CHAINS**



**A NEW**

**HOUGH Payloader** 'HUFF' PATENTED

**MODEL HF**

New addition to the Hough Payloader line, the speedy  $\frac{3}{4}$  yard Model HF provides many new operating features which contribute to superior performance. Bucket dumps and relatches hydraulically, a new fully reversible transmission provides fast forward and reverse speeds with less shifting, the tip-back bucket and forward crowding action assure full capacity loads in tough digging.

The Model HF is well suited to excavation, stripping, bulk material handling, loading trucks, short haul earth moving, street and highway construction and maintenance, snow removal, or any job requiring large capacity plus exceptional mobility. It will pay you to get complete details.

## Extra Features of HOUGH Bulldozer-Shovels Cut Yardage Costs Sharply

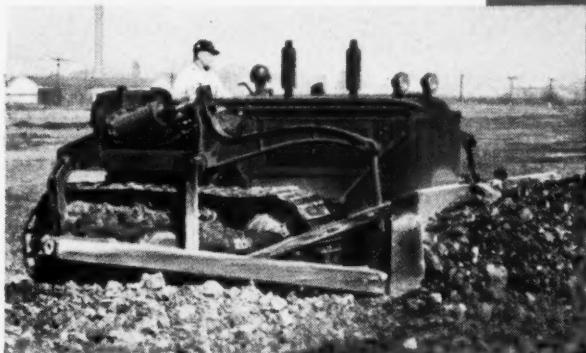
The many extra features found only in Hough Bulldozer Shovels add up to important advantages to you — more yardage per shift, more profit per yard.

Features such as hydraulic bucket dump and relatch; the tip-back bucket to prevent spillage; true crowding action for greater capacity; unobstructed visibility in all directions; hydraulic down pressure for tough digging, assure consistently high production. Hough Bulldozer Shovels are built *only* for International Crawler Tractors—providing a completely balanced combination of power, speed, and traction to handle jobs that ordinary units cannot touch. Hough Shovels provide proven performance; based on the engineering skill and experience gained in building over 6500 tractor shovels. Get complete details today from your nearest Hough-International distributor or write direct for literature.

**THE FRANK G. HOUGH CO.**  
MATERIAL HANDLING EQUIPMENT SINCE 1920  
706 Sunnyside Avenue. Libertyville, Illinois

*The Unbeatable Combination*

# INTERNATIONAL Diesel Crawlers with Allied Manufacturers' Matched Equipment



WHEREVER International Crawler Tractors do the earth moving, road building or excavating with matched bulldozers, you'll find them unbeatable!

These tractors and their matched equipment are mated. They are made for each other and designed to work together as a unit. Each is the product of engineering skills possessed by the leaders in their fields. Each is the product of companies that know how to build superior performance and durability into their machines. Together they produce results that mean operating economies and better profits for users everywhere, day after day . . . year after year.

Depend on the International and allied manufacturer's package as supplied by International Industrial Power Distributors. *It's the unbeatable combination.*



Industrial Power Division

INTERNATIONAL HARVESTER COMPANY  
180 North Michigan Avenue Chicago 1, Illinois

# INTERNATIONAL POWER

CRAWLER AND WHEEL TRACTORS • DIESEL ENGINES • POWER UNITS



## ***in a BALANCED Earthmoving Team***

What's the performance tip-off on a *balanced* earthmoving team?

Watch a Bucyrus-Erie Bullgrader-International crawler tractor combination for the answer! Note how this combination unit sweeps through the cut with smooth, even action, without gouging, nosing down, jerking or stalling. See how the tractor tracks work full length on the ground, without wasting traction "pulling against air". And, most important of all, check into the output and note the superiority there.

Bucyrus-Erie Bullgraders and bulldozers are so carefully designed to fit International crawler tractors that these tractors retain all of their operating characteristics and effectiveness. The weight of the equipment and the digging

loads imposed are properly distributed to give you full advantage of all the power furnished by the tractor. This means more power at the blade, more dirt moved, less fuel burned. It also means lower repair costs, because even distribution of track roller loads prevents excessive wear and strain on tractor front idlers and rollers.

Your International Industrial Tractor Distributor will gladly give you the full story on these balanced earthmoving teams. Ask him about them—and about the complete line of Bucyrus-Erie tractor equipment as well. Bucyrus-Erie Company, So. Milwaukee, Wisconsin.

For **BUCYRUS  
ERIE** Balanced Tractor Equipment

72T47

See Your  
**INTERNATIONAL**  
Industrial  
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Distributor

# **on city street or mountain pass complete water-cooling Pays YOU**

Whatever the size of your job . . . whatever its location . . . a Gardner-Denver Portable Air Compressor gives you the confidence of a steady, uninterrupted air supply. Complete water jacketing of all cylinders protects you from overheating in the 130° heat of desert or jungle — and from cold "unlubricated" starts in the sub-zero temperatures of the Arctic. And at any altitude, these two-stage

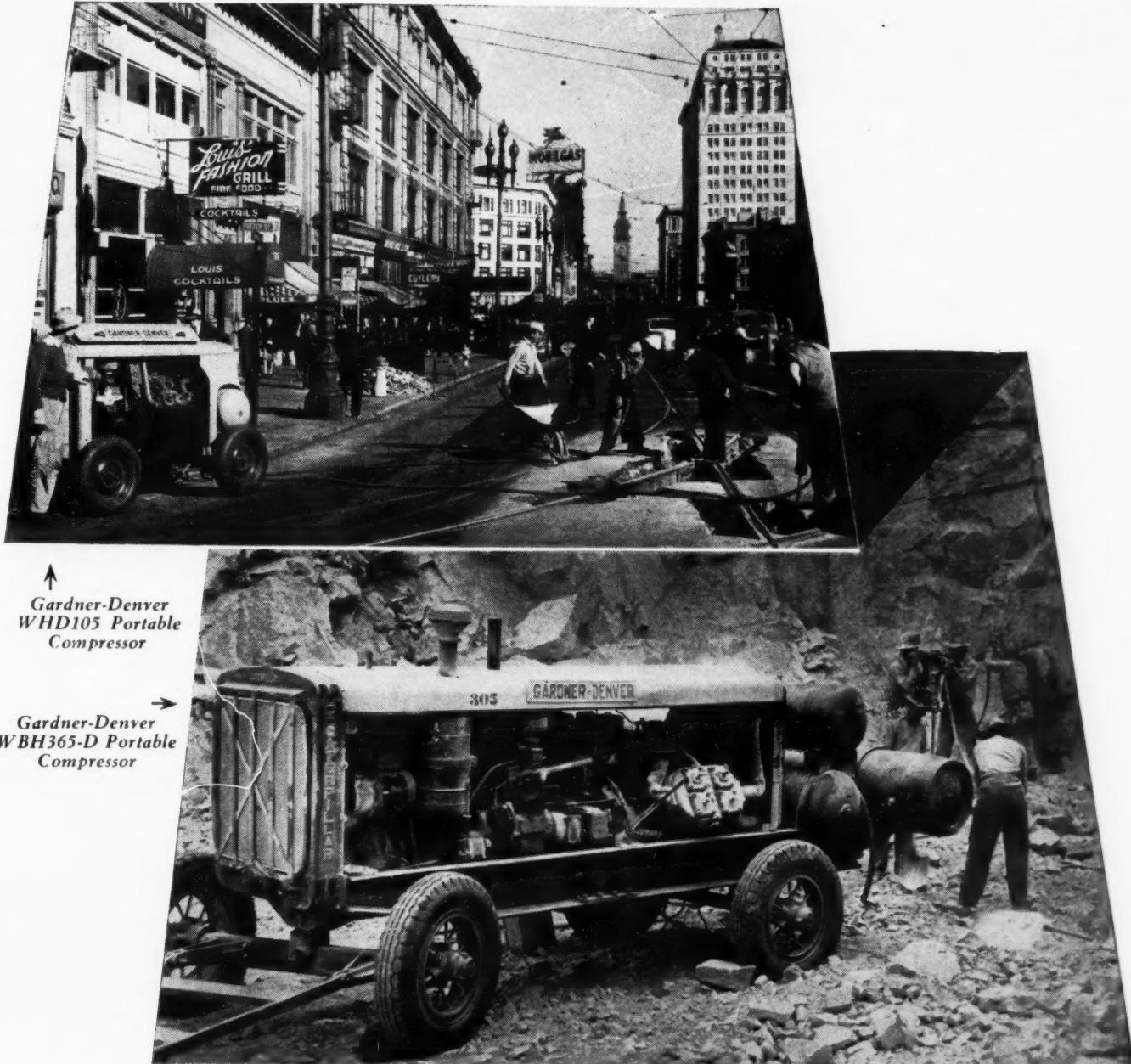
water-cooled air compressors retain their high efficiency — deliver full output continuously without high discharge temperatures so destructive to air hose and so conducive to excessive oil consumption.

For complete information about Gardner-Denver Portable Air Compressors, write Gardner-Denver Company, Quincy, Illinois.



## **GARDNER-DENVER**

SINCE 1859



↑  
Gardner-Denver  
WHD105 Portable  
Compressor

→  
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WBH365-D Portable  
Compressor

# TRUCKERS AGREE:



"You put  
**SAFETY FIRST**  
when you ride on  
Armstrong **Rhino-Flex**  
Tires!"

#### Truckers Praise Safety Qualities of Armstrong's New **Rhino-Flex** Truck Tires with Rayon Cord

NOW—you can roll your trucks on the safest tires ever built by Armstrong, leading truck tire manufacturers since 1912.

Armstrong engineers have developed a truck tire with a carcass that's tough as a rhino's hide—yet flexible enough to "give" with road shocks—and snap back for more. That's why the new **Rhino-Flex** Armstrong Tire wears more evenly, longer—is safer!

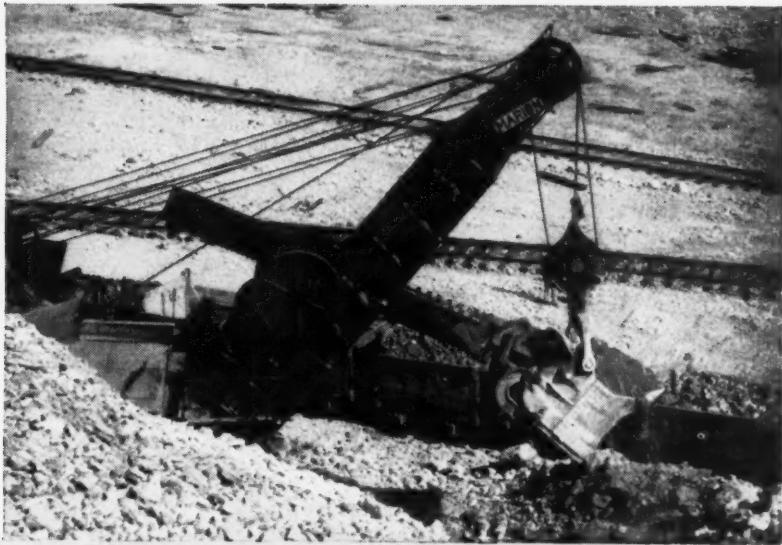
Today, this great new truck tire, with tougher, tighter twisted rayon cord, is available at Armstrong dealers coast to coast. See it—compare it with any truck tire, regardless of price. You'll choose Armstrong for its safety, strength, flexibility, cooler running.



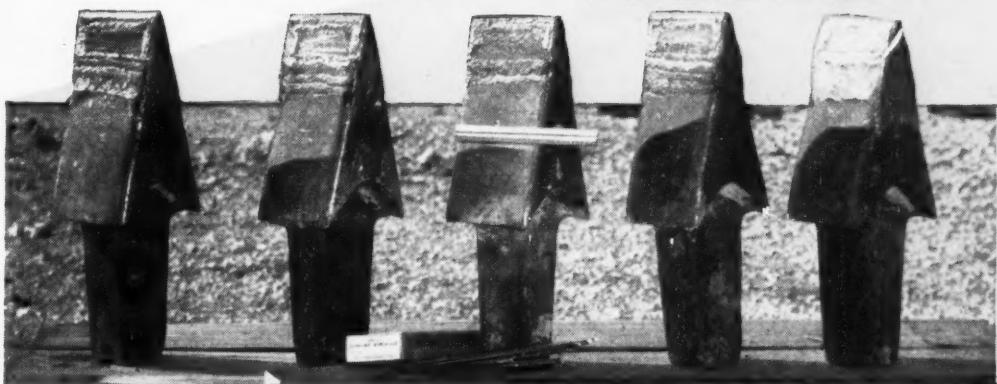
# ARMSTRONG *Rhino-Flex* TIRES

Manufacturers of Quality Tires and Tubes Since 1912 • General Offices and Plant—460 Elm Street, West Haven 16, Conn.

**WELD  
A BULWARK  
AGAINST  
WEAR**



**WITH**



**AMSCO**  
**Conservation**  
**Welding**

**REDUCE DIPPER MAINTENANCE, SHUTDOWNS, POWER COSTS . . . PROTECT TEETH  
WITH AMSCO ECONOMY HARDFACE**



Whip rapid wear — dipper teeth stay sharp; give long, low cost service when protected with impact and abrasion resisting deposits of Amsco Economy Hardface Welding Rod. The results on the dipper operation pictured: fewer shutdowns, lower maintenance costs, increased power savings — that's the report from this large quarry.

Amsco Economy Hardface: 450 to 550 Brinell hardness, even when forged and air-cooled, fights severest abrasion . . . self-hardening for fast results in field or shop . . . tough for maximum resistance to impact . . . plain or coated for any welding set-up. Rock crusher jaws, pulverizer and grinder wearing parts, conveyer chains, idlers and rollers, scarifier teeth — all are Economy Hardfaced by this quarry, long a user of Amsco Conservation Welding products which include build-up and hardfacing welding rods, filler bars and flux.

**AMERICAN  
Brake Shoe  
COMPANY**

Foundries at Chicago Heights, Ill., New Castle, Del., Denver, Colo., Oakland, Calif., Los Angeles, Calif., St. Louis, Mo.

Offices in principal cities. Made and sold in Canada by Canadian Ramapo Iron Works, Inc., Niagara Falls, Ont.

**AMERICAN MANGANESE STEEL DIVISION  
CHICAGO HEIGHTS, ILL.**

# PULL to bull-through any going!



The  
right  
tire  
for  
each  
job

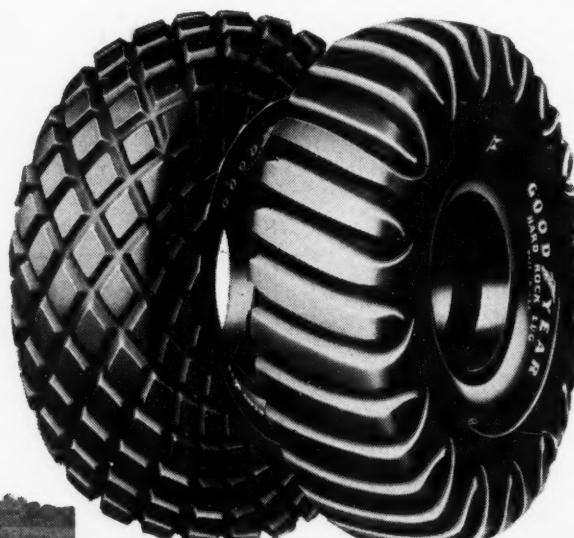
BUY and SPECIFY  
GOOD YEAR  
— it pays!



Sure-Grip, All-Weather—T.M.'s The Goodyear Tire & Rubber Company

YARDAGES get moved *on schedule* at lower cost with this tire on your drive wheels. It's Goodyear's great Sure-Grip—"right" on the job because it's packed with pull, and tough as they come. That *open center* self-cleaning tread makes each lug bar a *separate* traction cleat that digs in deep, takes firm grip with minimum slip, pulls sure and steady in soft going.

No wonder the Sure-Grip is *first choice* wherever pulling power is the top need! And when you add in the low-cost, long-life performance typical of *all* job-proved Goodyear work tires, you see why Goodyears *stay* first choice—why year after year, *more yards are moved on Goodyear off-the-road tires than on any other kind!*



ALL-WEATHER EARTH MOVER  
for drawn vehicles and  
general traction

HARD ROCK LUG  
for super stamina in all  
rock work

# GOOD YEAR

MORE YARDS ARE MOVED ON GOODYEAR OFF-THE-ROAD TIRES THAN ON ANY OTHER KIND